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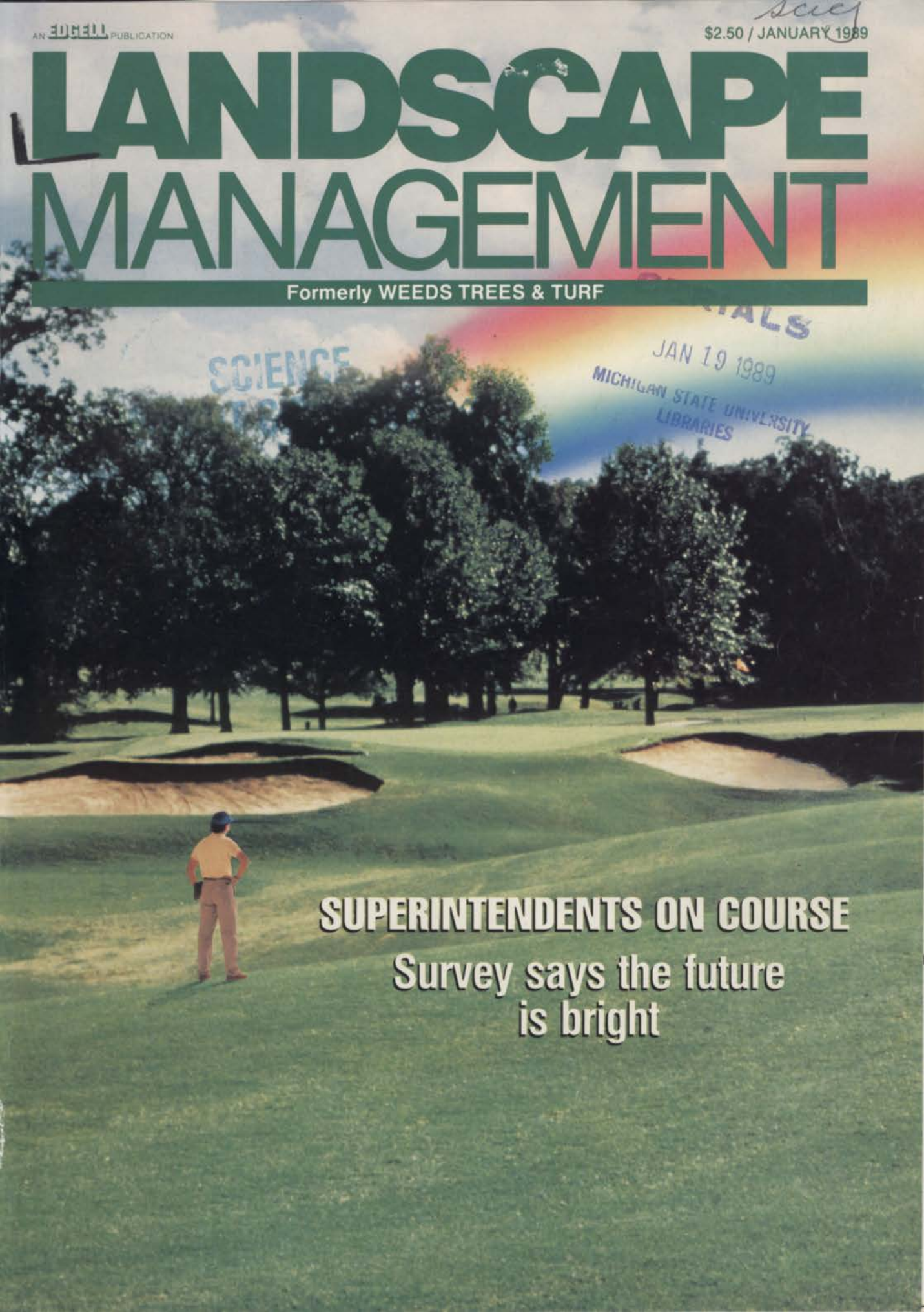

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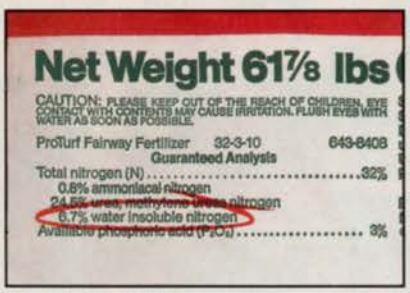
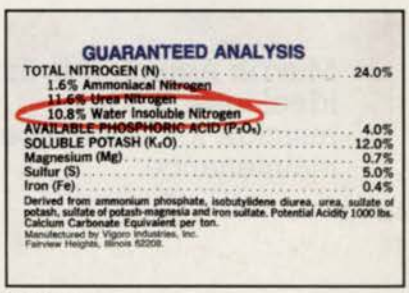
READ ...the fine print.


Net Weight 61⅞ lbs
CAUTION: PLEASE KEEP OUT OF THE REACH OF CHILDREN. EYE CONTACT WITH CONTENTS MAY CAUSE IRRITATION. FLUSH EYES WITH WATER AS SOON AS POSSIBLE.
ProTurf Fairway Fertilizer 32-3-10 643-8408
Guaranteed Analysis
Total nitrogen (N) 32%
0.8% ammoniacal nitrogen
24.5% urea, methylene urea nitrogen
6.7% water insoluble nitrogen
Available phosphoric acid (P2O5) 3%

Scott's ProTurf

GUARANTEED ANALYSIS
5.5% Water Insoluble Nitrogen
3.5% Urea Nitrogen
Available Phosphoric Acid (P2O5) 5%
Soluble Potash (K2O) 9%
Magnesium (Mg) 1.0%
Sulfur (S) 8.0%
Iron (Fe) 1.0%
Manganese (Mn) 0.5%
Nutrient Sources: Urea, Methylene Ureas, Ammonium Phosphate, Ammonium Sulfate, Ammoniated Superphosphate, Sulfate of Potash, Oxides, Ferrous Sulfate, Sulfates.
Potential Acidity Equivalent 1300 lbs. Calcium Carbonate per Ton.

Lebanon Country Club


GUARANTEED ANALYSIS
TOTAL NITROGEN (N) 24.0%
1.6% Ammoniacal Nitrogen
11.6% Urea Nitrogen
10.8% Water Insoluble Nitrogen
AVAILABLE PHOSPHORIC ACID (P2O5) 4.0%
SOLUBLE POTASH (K2O) 12.0%
Magnesium (Mg) 0.7%
Sulfur (S) 5.0%
Iron (Fe) 0.4%
Derived from ammonium phosphate, isobutylidene diurea, urea, sulfate of potash, sulfate of potash-magnesia and iron sulfate. Potential Acidity 1000 lbs. Calcium Carbonate Equivalent per ton.
Manufactured by Vigoro Industries, Inc.
Fairview Heights, Illinois 62208

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For Sulfur Coated Urea (SCU), research has shown that by the time it is spread, about 50% is immediately soluble, effectively doubling your cost of controlled-release Nitrogen and cutting the benefit in half!

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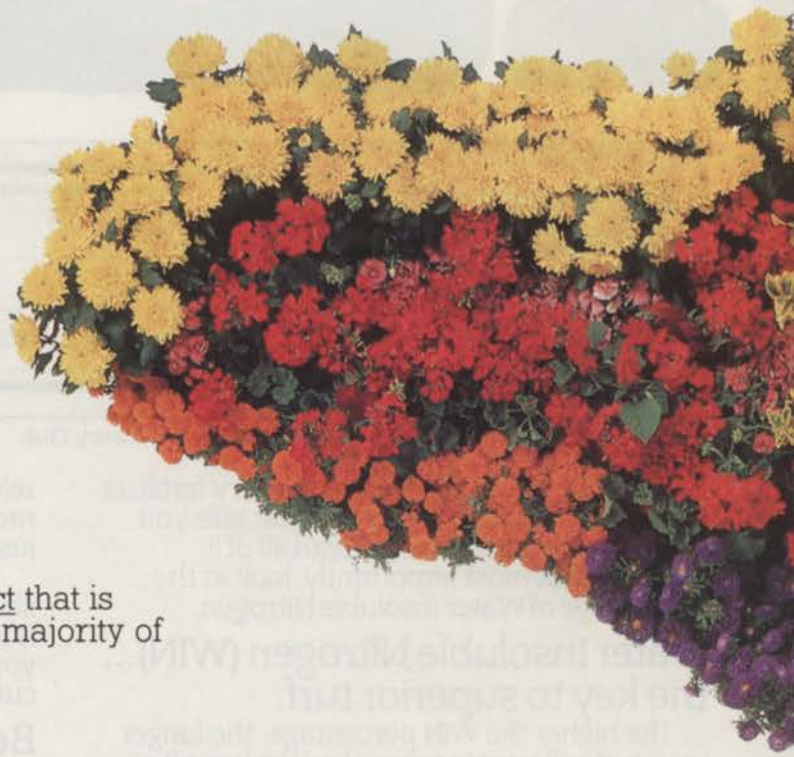

It is a non-restricted product that is highly effective against the majority of insect and mite problems.

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flow® all over this page.

Mavrik is also very concentrated. So you have less to buy, carry around, or store. It's safe to use and Mavrik leaves no odor and little visible residue.

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JANUARY 1989, VOLUME 28, NUMBER 1

LANDSCAPE MANAGEMENT

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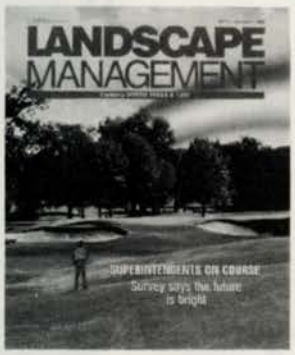

On the cover: It is indeed a bright future for the golf course industry

30 COVER STORY: SUPERINTENDENTS ON COURSE
by Will Perry. Golf course budgets continue to increase. Our nation's superintendents tell us they're sinking the extra cash into more fertilizers, pesticides—and especially irrigation systems.

36 ROOM TO BREATHE
by Terry McIver. Why aerate? What to aerate with? This article and chart answers your every question.

46 PEOPLE, A TREE'S WORST ENEMY
by Terry Tattar, Ph. D. More urban trees are being killed or injured by people than by diseases and insects .

50 LOW INPUT LANDSCAPING
by W.M. Mitchell, Ph.D. Lawn grasses are one of the hardiest plant systems known. They can take care of themselves.

56 WARM-SEASON ATHLETIC FIELD CALENDAR
by John R. Hall III, Ph.D. A schedule of management for athletic fields in warm-season areas of the U.S.

71 A SWINGING SAFARI
by Ann Reilly. How East Africans care for resorts without the equipment expertise available in the U.S.

78 IRRIGATION IDIOMS
by Jerry Roche. Listen to Michael Essenwein of RainBird tell how to beat irrigation problems.

82 PARADISE FOUND
Superintendent Short Honma and his people consider management of Kapalua golf courses a 24-hour job.

86 TRAINING ON ENGINES
Experts from Onan Corp. run down the requisites of a good engine training program for your employees.

92 TO LIGHT AT NIGHT
Selling nightlighting to owners and developers can be very difficult, unless you explain it to them.

DEPARTMENTS

6 As I See It . . .
8 Green Industry News
14 Short Cuts
22 Letters
26 People
90 Project Profile
94B Jobtalk
96 Research Update
98 Article index, 1988
102 Products
106 Classified
114 Ad Index
116 Problem Management

LM Editorial Staff

Jerry Roche
Editor

Will Perry
Mg. Editor

Terry McIver
Assoc. Editor

LM Editorial Advisory Board

Doug Chapman
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Lincoln, NE

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AS I SEE IT...

Applying the 'pixie dust'

The Disney Company has been accused of doing a lot of things to keep its employees happy. The most notable is sprinkling employees with pixie dust every morning.

This is not the case, according to Franki Turner, Walt Disney World's manager of marketing and seminar production operations. But what the company *does* do to keep employees happy also applies to the green industry.

"Our corporate management knows that image is very important to preserve," Turner says. "Every person at Disney realizes that. A ticket-taker sees 20,000 more guests a week than (WDW president) Dick Nunis. That person is one of the key marketing tools we have."

Turner said new employees are imbued with what she calls "corporate culture." She defines that as (1) tradition of the past, (2) operations of the present and (3) visions of the future. "They make up the culture of almost every organization. And we try to keep it simple and clean so it's understandable by all 23,000 employees."

Franki Turner

After the company's culture has been defined, Turner says that three additional follow-ups keep employees loyal and happy.

No. 1 is training. One full day is set aside to show new employees how to go through the cafeteria line, how to make out time cards, where lockers are, etc. On-the-job training lasts anywhere from three days to two weeks, depending on the job.

No. 2 is communication, one of Disney's strong suits. The company uses bulletin boards, clever videos, newsletters and—most of all—personal contact (managers being what is called "out-in-the-area").

No. 3 is care. Disney shows it cares for its employees. The company holds annual picnics and chooses one date a year on which employees and their families can get in the park for free. Disney even goes so far as to help find temporary and permanent housing, and—very important—promotes heavily from within.

Teamwork is of utmost importance. "No one ever says 'it's not my job,'" notes an employee in the standard Disney training video.

Finally, Turner notes, "Cast members (employees) are treated as we expect them to treat the guests."

These ideas, clearly, don't only work for the entertainment industry. They are also applicable to the green industry and others.

Use your imagination. Sprinkle some pixie dust on your employees!

Jerry Roche

Jerry Roche, editor

EDITORIAL STAFF

Jerry Roche, Editor
Will Perry, Managing Editor
Terry McIver, Associate Editor
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100
FAX (216) 826-2832

MARKETING STAFF

Dick Gore, Publisher
Office: 455 E. Paces Ferry Rd.
Suite 324
Atlanta, GA 30305
(404) 233-1817
FAX (404) 261-7022

Jon Miducki, National Sales Manager
Marsha Dover, Midwest Sales Manager
Gloria Cosby, Eastern Sales Manager
Bob Earley, Group Vice President
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100
FAX (216) 826-2832

Robert Mierow, W. Coast Representative
Office: 1515 NW 51st Street
Seattle, WA 98107
(206) 783-0549
FAX (206) 784-5545

Tom Greney, Senior Vice-President
Office: 111 East Wacker Drive
Chicago, IL 60601
(312) 938-2317
FAX (312) 938-4850

SUPPORT STAFF

Carol Peterson, Production Mgr.
Marilyn MacDonald, Prod. Supervisor
Bob Andresen, Graphic Design
Becky Gothner, Circulation Super.
Bonnie DeFoe, Directory Coordinator
Gail Parenteau, Reader Service Mgr.
Office: 120 West Second St.
Duluth, MN 55802
(218) 723-9200
FAX (218) 723-9223

David Komitau, Graphics Coordinator
Ted Matthews, Promotion Director
Office: 7500 Old Oak Blvd.
Cleveland, OH 44130
(216) 243-8100

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Robert L. Edgell, Chairman; Richard Moeller, President; Lars Fladmark, Executive Vice President; Arland Hirman, Vice President/Treasurer; Thomas Greney, Senior Vice President; Ezra Pincus, Senior Vice President; Joe Bilderbach, Vice President; James Gherna, Vice President; George Glenn, Vice President; Harry Ramaley, Vice President.

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GREEN INDUSTRY NEWS

JANUARY 1989, VOLUME 28, NUMBER 1

LANDSCAPE MANAGEMENT

Phone survey emphasizes possible lawn care clients

A wealth of potential customers among current do-it-yourselfers believe professional lawn care is overpriced.

This fact from results of a Monsanto telephone survey, revealed by David Duncan, Ph.D., director of the company's product development. He gave a presentation during the PLCAA's national convention in New Orleans.

The survey compares the do-it-yourselfer (DIY) to the professional lawn care user in three categories:

1. Frequency of use

Forty-nine percent of the respondents used professional lawn care in the 12 months prior to the survey. However, 87 percent supplemented that care with their own.

Twenty-four percent of those surveyed had what they termed "a tendency toward lawn care," but like it to be done for them. Of that 24 percent, half had indeed purchased lawn care in the past year.

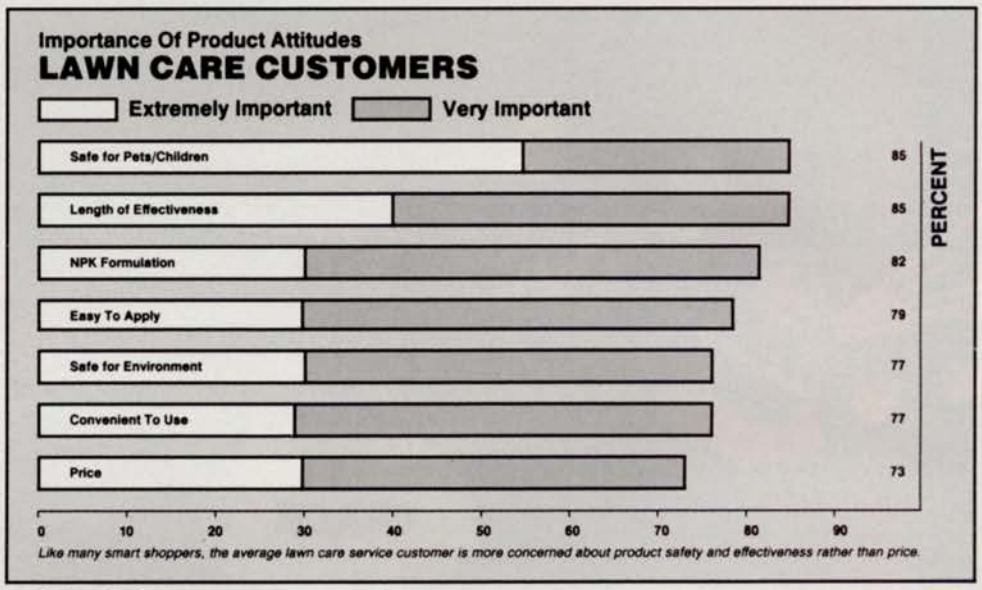
By projecting the figures nationally, Monsanto believes 16 million Americans have that "tendency" to purchase services, yet only 7.8 million follow through.

"A significant amount of the population is inclined toward lawn care, and they can be brought back," says Duncan. "That is a heck of an opportunity if people get out there and talk to these customers."

2. Demographics

Of great significance to

continued on page 14



Like many smart shoppers, the average lawn care service customer is more concerned about product safety and effectiveness rather than price.

LEGISLATION

Green industry group battles overzealous N.Y. legislators

A group of lawn care and pest control organizations has filed suit in the U.S. District Court against the state of New York. If they win, the state would have to stop the implementation of pre-notification laws. The regulations were devised by the New York Department of Environmental Conservation (DEC).

At stake is whether lawn chemical and pesticide applicators must follow stricter pre-notification rules. The applicator organizations believe the regulations are unfair and redundant intrusions on the industry's business sector. They further believe the laws are preempted by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Industry groups acting as plaintiffs in the case are the New York State Pesticide Coalition, Professional Lawn Care Association of America, Pesticide Public Policy Foundation, National Pest Control Association and National Arborists Association. Leaders are Elizabeth Seme, executive director of both the New York State Turfgrass Asociation and the Green Council, and Walter Schroeder, business owner and president of the New York State Professional Applicators Coalition.

"The concept of what they (state DEC) have done is outrageous," says Schroeder. "They have no consideration for the economics or lack of practicality involved. It's strictly an agenda set forth by powerful environmental lobbyists."

"The new regulations are extremely complicated and cumbersome," says Dave Sek, vice president of Monroe Tree and Lawn Tender, Rochester, N.Y. He believes the regulations would make it difficult for companies to schedule applications, especially for multiple dwelling units and business complexes.

cont. on page 14

"There are so many things to do as far as pre-notification goes," says Sek, "it will be hard to do a good job of scheduling and completing a project on a timely basis."

Title 10 requires commercial lawn care applicators to enter into written contracts with customers, provide warnings, and post the perimeter of treated areas with warning signs. The new notification regulations require most pesticide applicators to provide detailed written notification to owners and occupants of buildings or commercial property where pesticides are applied. The regulations mandate posting warning signs, specific contract language and "cover sheets" be given to the owners or occupants of homes or businesses prior to a pesticide application.

More 'labelling'

The combined forces of the green industry and pesticide groups argue that the entire notification system constitutes additional "labeling,' prohibited by Section 24(b) of FIFRA.

"We're in favor of notification," says Schroeder, "but we feel that the notification regulations are confusing and are not going to properly notify the consumer. So much paperwork is involved that the consumer will not be able to pick out the important facts."

Schroeder believes the case basically stems from an abuse of power by the state DEC.

Optimism?

James F. Wilkinson, executive director of the Pesticide Public Policy Foundation, says the coalition has reason to be optimistic.

"We have been discussing the issue from a legal perspective with several different attorneys," Wilkinson says. "The Pesticide Coalition did not jump into this thing without checking it out with different people, and the consensus: we have a good chance of winning." □

LANDSCAPING

Job estimating: don't guess; practice, practice, practice

Have you ever completed a job, picked up the check and deposited in the bank, and find yourself asking the question, "Did I price that job fairly?"

Sure you have. Or will. That's why it's important—in the interest of fairness and good business—to practice accurate and thorough estimating.

Phil Christian, president of PDC Consultants, is a stickler for accurate estimates, which he spoke on at the recent Landscape Exposition in Nashville, Tenn.

"Estimating is a procedure that we must go through to establish a sale price for our services," said Christian. "The cost estimate must include all labor, material, equipment and overhead, plus profit. Estimating the cost of services on a specific landscape means the estimate must be unique to the site."

And, of course, you must also know each quantity in the estimating formula. "If you don't know the distance you travel to the job, there can be no calculations due to the absence of a known quantity," Christian said.

Estimating, says Phil Christian, is a procedure that we must go through to establish a sale price for our services.

Christian believes production factors are variables, and may be adjusted as required to protect the accuracy of the estimate.

"If we noted during the first hour of the trip that we were below our production factor of 50 mph," Christian continued, "what could we do to protect the original estimated time of arrival? We could increase the production factor to 50 mph, or increase production to fit the new circumstances, and keep the original estimate."

Measuring the landscape is easy, and simply involves four basic quantities: area of turf, linear feet of edging, area to be pruned, and area of shrub beds or mulch area. Combine these areas or take percentages of them to estimate the linear feet covered by all maintenance activities.

"Measure all the turf area," advises Christian, "no matter what condition the turf is in. Any large bare spots are included in the measurement, and duly noted on the analysis report."

Make a category called "push mower," for all areas that cannot be mowed with a 36-inch or larger mower. Examples? Very steep slopes or areas too narrow for a 36-inch mower to handle without disturbing the beds on both sides.

Other special attention areas should be indicated as such:

- rough-cut areas, or areas to be bush-hogged several times each year;
- large open areas or athetic fields that may require special equipment or frequency; or
- wet or swampy areas. □

LAWN CARE

Companies rally behind PR plans

In light of recent regulatory and legislative mudslinging, the Professional Lawn Care Association of America (PLCAA) has formed a public relations network. This action is being taken to reinforce the industry's reputation with the consumer.

Rick Steinau, president of Greenlon and Ace Exterminating Co. and a PLCAA director, said the campaign has a two-fold purpose. The first is to beat anti-pesticide groups to the punch by informing the media of the issues first. The second is to publicize the benefits of effective lawn care and landscaping services (cooling effects, erosion control, noise abatement, etc.). Monthly news releases will be sent to local garden editors, on company stationery, with appropriate quotes included. Steinau says response to the program has been fantastic.

"It's what I predicted would happen," says Steinau. "Once we had an opportunity to present the program to the membership, and they saw the ease with which it would happen, it was accepted."

Steinau said at least 77 cities are now represented by media contacts.

Contact companies will have to foot an annual mailing bill of about $300, but that's a small price to pay, considering the plan's potential benefits.

The first releases will be mailed in February. □

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Competition, We Ou

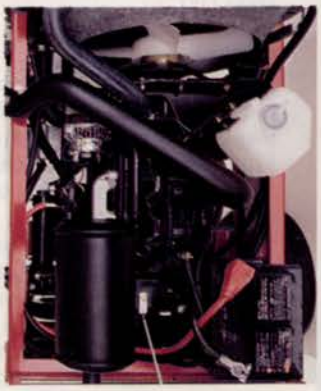
To make a dramatic turnaround in your productivity, put yourself behind the wheel of the machine that outmaneuvered them all: The new Groundsmaster® 220-D or the new gas-powered 224 from Toro. No other out-front rotary mowers are as maneuverable, as effortless to operate or provide as much trim productivity.

Fourlink power steering is your link to unmatched maneuverability. Now operators can make sharper, easier turns with less fatigue. This makes trimming around any obstacle quick and almost effortless.

To give you even more cutting control, Groundsmasters feature a single knob deck-to-tractor weight transfer system. A twist of the wrist is all it takes to balance cutting unit flotation to height of cut and traction needs. The result is better traction and better flotation without scalping.

When it comes to engine size, Toro gives you the power of choice. The new Groundsmaster 220-D features a 20 hp liquid-cooled, 3-cylinder Mitsubishi diesel engine. The new Groundsmaster 224 gives you the same engine in a gas model, providing you with the durability diesels are known for, but with more power. Both give you all the speed and power needed for the most demanding jobs.

The Groundsmaster 220 also is available with a 20 hp air-cooled gas engine.



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A small, compact wheelbase provides a small uncut trim circle and tight turn-around enabling you to trim close around any obstacle. Just what you need to get into or out of tight areas.

With all these performance features, it's obvious why the new Groundsmaster 220-D and 224 are so popular. And why Toro is the leader in out-front riding rotary mowers. To request a demonstration, call your local Toro distributor or contact Toro at the address below.

TORO

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A patented, heavy-duty carrier frame with floating cutting decks allow the cutting units to follow ground contours for a superb quality of cut. For added cutting control, there are three decks to choose from: 72", 62" or 52". And the 52" is available with an optional grass collection system.

The Toro Company, Commercial Marketing Services, 8111 Lyndale Ave. So., Minneapolis, MN 55420.

Circle No. 166 on Reader Inquiry Card

SHORT CUTS

ORIGIN OF SPECIES... Ever wonder where kikuyugrass got its name? **Ann Reilly**, a noted garden writer, has a theory. During a trip to Kenya, she made these revelations: "I don't know for sure, but I supect the grass was named for the African tribe of the same name who were instigators of the Mau Mau rebellion back in the '50s. The Kikuyu tribe believes its god lives on top of Mount Kenya. If it does, he certainly gave them a grass that seems to never be bothered by insects, disease or lack of water."

FROM THE ORIENT... Much ado has been made about the business acumen of the Japanese, and with reason. Here are some observations that **Roger Funk**, Ph.D., of the Davey Company made at the most recent PLCAA conference: "The reason Japan is more successful in service industries is that they have learned to ask the customers what they want. Clients have changed and lawns have changed and many of you haven't. The customer is getting more sophisticated, more demanding than ever. We want to target the client that wants and needs and can pay for all our services. All you have to do is track who's buying what services." Funk always makes it sound so easy.

LUCKY FELLER... Speaking of the PLCAA conference, Delta offered two tickets anywhere the airline flies, to those PLCAA attendees using the airline to get to and from New Orleans. The lucky guy was **Nick Dennis** of Pro Lawn Plus in Jacksonville, Fla. And a bon voyage and sayonara to him.

SUPER STATS... Industry figures that emerged from Elanco Company's distributor's meeting late last year: ● In 1975, 12,800 golf courses spent $75 million on fertilizers and chemicals; by 2000, the numbers are expected to be 15,270 spending $455 million. ● In 1975, 2.2 million residential lawns were being professionally serviced with fertilizer and chemical sales of $72 million; in the year 2000, those numbers might be 7.7 million with sales of $835 million. ● In 1975, 1.55 million landscaping customers spent $59 million on fertilizers and chemicals; in 2000, they see 2.7 million customers spending $480 million.

THINGS NEVER CHANGE... From the October, 1962 issue of *Weeds and Turf*: "We just saw a letter to the editor of a local paper, in which a lady gardener protests, on behalf of her garden club, about the so-called misuse of pesticides. This worried do-it-yourselfer says she asked her club (about 40 ladies) how many read labels on their garden chemicals and only four answered 'yes.' This, the lady proceeds, is the reason we need more laws about pesticides! Some hardworking custom applicator, who's spent years trying to convince his customers that labels *must* be read, would no doubt like to refute this Rachel-Carson-in-the-bud, since it is frequently the professional who gets unjustly blamed for the amateur's mistake."

SURVEY *from page 11*

Duncan is this survey fact: 75 percent of the time, the male of the household makes the decision to purchase lawn care.

"That's no slight to the females," assures Duncan. " That's just the way it is."

To make the best use of this fact, Duncan says LCOs must prospect more at night and in person. "You have to figure out ways to get to the male decision-maker."

Professional users are likely to be over 40 (73 percent), are college graduates earning more than $25,000 incomes and live in the mid-Atlantic region of the northeastern United States.

DIYs are generally under 40 years of age, earning $15,000 to 35,000 per year. Chances are 50-50 of a college education.

3. Attitudes toward lawn care

Duncan uses the term "psychographics" to describe this category.

The DIY is guided by the belief that an attractive lawn is indeed important and worth the necessary time. However, the DIY is unimpressed with lawn care and believes it to be "not worth the expense." Brand names mean nothing to the classic DIY.

Professional customers believe an attractive lawn is important and worth the expense. They attach to that belief a sense of pride in their lawn's appearance. Brand names mean a lot to professional users, and they will pay more for quality work. □

LAWN CARE

PLCAA draws 700 companies to convention

Though it didn't crack any records for overall attendance, the Professional Lawn Care Association of America convention and trade show drew more lawn care companies than it ever has.

"We had fewer people per company, but we drew almost 700 companies," said PLCAA assistant executive director Doug Moody. "There's a certain levelling off in terms of growth. We're going to have to try some new twists on the show floor next year."

The 1988 conference and trade show was held in the Louisiana Superdome with 185 manufacturers and suppliers buying space.

"Who would've thought, four years ago, that we'd be in the Superdome," noted executive vice-president Jim Brooks. "And the Republicans (at the Republican Na-

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tional Convention) used only half of it. We got the whole damned thing!"

Mike Spicer of Perma Green in Boise, Idaho, accepted *Lawn Care Industry* magazine's "Man of the Year" award on behalf of former owner Jim Marria, who died in a plane crash on his way home from the 1987 PLCAA convention.

"Jim kind of looked at this association as his company," Spicer said of the former PLCAA president. "If Jim were here today, he'd be very honored."

PLCAA president Russell Frith of Lawn Doctor, Matawan, N.J., speaking at the annual business meeting, said the organization is establishing a $100,000 foundation in the names of former presidents Marria and Bill Fischer, who passed away earlier in the year.

Frith noted that the PLCAA gained about 300 new members in 1988 to bring its membership to 1300, three times what it was four years ago.

Frith also presented a plaque to Dow Chemical's Larry Speer for the donation the company made to the Special Olympics in the PLCAA's name. Monsanto, Ciba-Geigy, Elanco and Dow also received plaques for contributions to the organization. □

PRODUCTS

New fertilizer is all organic

More than 35 golf course superintendents, horticulturists and landscapers were in Hilton Head, S.C., recently to preview a new organic fertilizer specially designed for sports turf and landscape use.

The product, Bio-Turf, is a safe, all-natural organic fertilizer for greens, tees and fairways, plus general landscaped areas. It is non-toxic, non-burning and non-polluting. It contains no urea.

"This was our first time out, and we were all very pleased with the reaction of these turf professionals to our new product," Bio-Turf founder Bob Onorato says. "Dr. Keith Karnok's talk on the growing importance of natural turf care products was informative and well-received by the group."

Karnok, a University of Georgia agronomist, is scientific advisor to Bio-Turf.

For more information on the product, contact the company at 23-B Shelter Cove Lane, P.O. Box 6507, Hilton Head Island, SC 29938; (803) 686-4700. □

Corrections

The October issue of LANDSCAPE MANAGEMENT contained an error (p. 26) relative to the formulation of Riverdale Chemical Co.'s Weedestroy product. Weedestroy does *not* contain dicamba. The correct formulation is MCPA + mecoprop + dichloroprop.

The October story on tree and shrub growth regulators incorrectly listed paclobutrazol (Clipper) as a turf regulator product of O.M. Scott & Sons (p. 54). Clipper is a *tree* growth regulator, marketed exclusively by Monsanto under license by ICI Americas. The only labeled application method presently approved for Clipper is by injection.

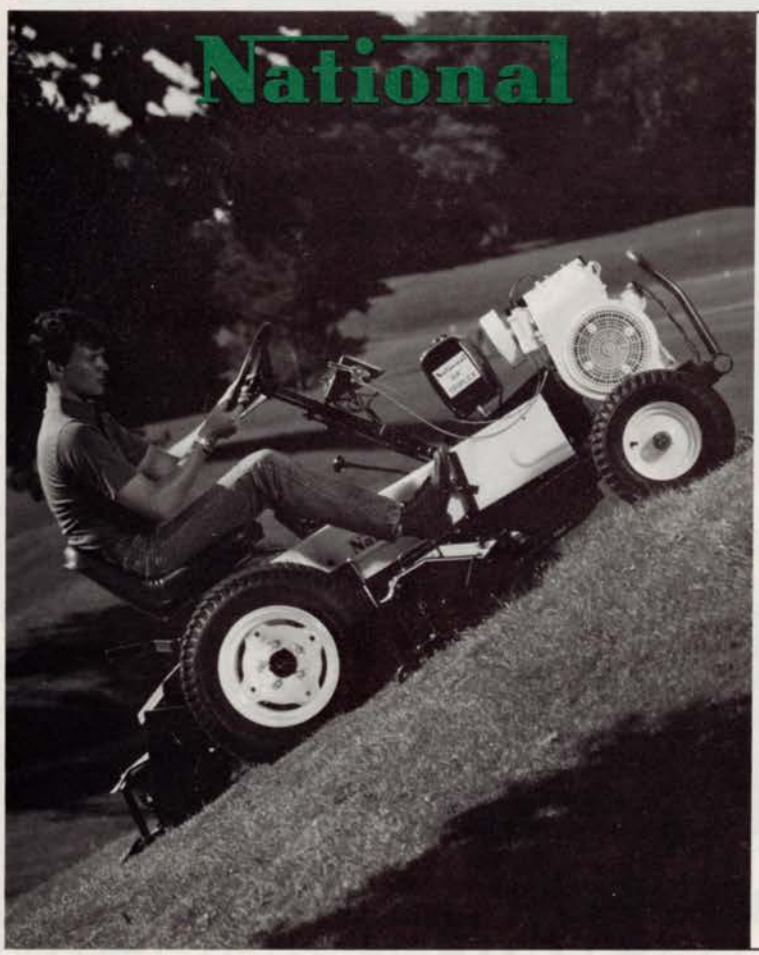
We apologize for any confusion these errors may have caused. □

EQUIPMENT

Deep aeration arrives in U.S.

What is called "deep-tine aeration" is being learned from landscape managers on the British Isles by their counterparts in the U.S. That, according to Stan Zontek of the USGA Green Section.

"When I first saw deep-tine aeration at St. Andrews



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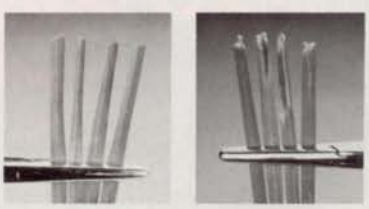

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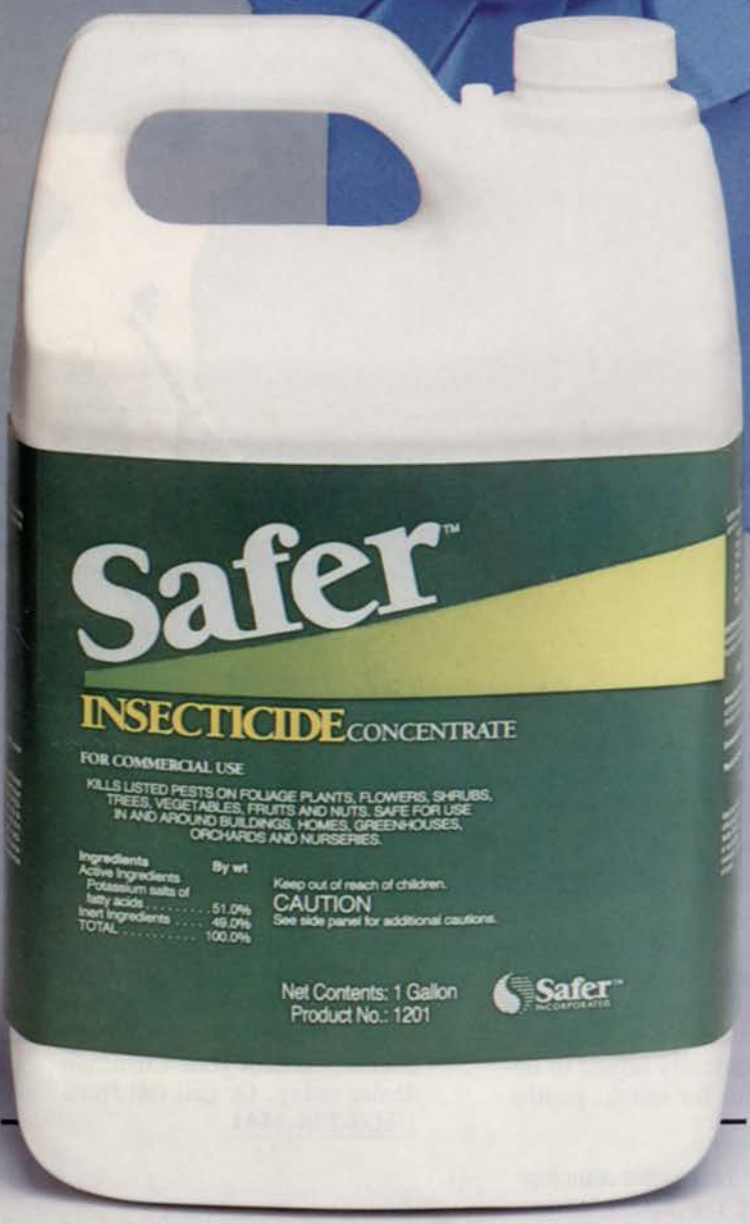
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in Scotland, they did the whole golf course," Zontek told attendees at the Ohio Turfgrass Conference. "The machine, called a Verti-Drain, allows you to aerate to depths of 6 to 12 inches. You bring up a tremendous amount of soil."

"The kicking action is the key to the Verti-Drain," Zontek continued. "The deeper you can punch a hole in troublesome soils, the better off you are."

The Verta-Drain is in use at Pine Valley Golf Course in New Jersey, according to Zontek. Other pieces of equipment that can be used with similar results are the Floyd McKay drill aerifier and the Aer-Way aerator, Zontek said.

"They give you a way to manage greens as an alternative to reconstruction," he concluded. □

LABOR

Firm provides temporary help

Amigos Empleo Legal Inc. provides temporary help to the green industry, according to company owner Bob Wingfield Jr.

"We have placed both laborers and foremen from Florida to New York with great success," he says. "Feedback from contractors indicates increases in production from 30 to 100 percent, not to mention reliability, which is second to none."

Amigos deals strictly with workers, both male and female, documented under the Irrigation Reform and Control Act of 1986. The company charges a modest fee to companies hiring the help.

For more information, write or call Wingfield at 5415 Maple Ave., Suite 112-A, Dallas, TX 75235; (214) 634-0500. □

CHEMICALS

Confront nears new EPA label

Confront herbicide, a new non-phenoxy broadleaf mixture under development by Dow Chemical Co., is expected to be approved by the Environmental Protection Agency next year.

"We submitted it for EPA registration in November," explains product technical manager Monique Mackasey, "and will hopefully get it by the third quarter of 1989."

The product is a post-emergence herbicide designed to control dandelion, narrow-leaf plantain, Canada thistle, oxalis, ground ivy and other weeds in cool-season grasses. Confront is an amine salt formulation containing one part clopyralid to three parts triclopyr per gallon.

Triclopyr amine is available for commercial sale in the Turflon line of herbicides, but clopyralid is a newly-developed herbicide.

Rob Peterson, Dow's turf marketing manager, sees a good fit for the product. "We think Confront offers several unique benefits to the turf care industry, including a significantly reduced active ingredient pay load per acre," he says.

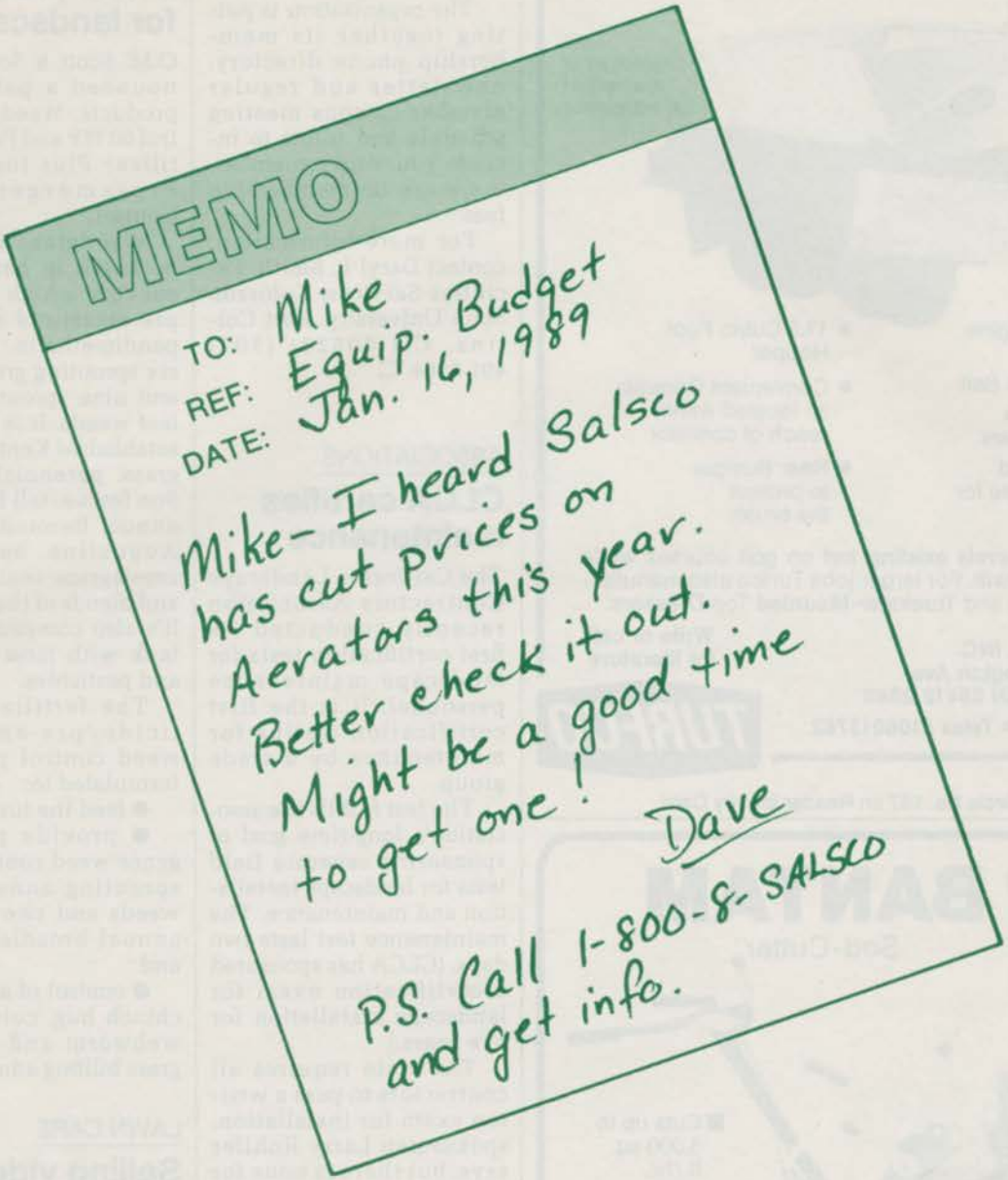
Results from an Indianapolis, Ind., test show that, eight weeks after treatment, tank mixtures achieved 91.7 percent control of broadleaf plantain, 91.7 percent control of ground ivy and 90 percent control of dandelion. A similar study at the University of Illinois in Urbana reports 100, 80 and 67 percent control of white clover, broadleaf plantain and dandelion, respectively. □

ORGANIZATIONS

Colo. grounds group expands

Attention all Colorado landscape managers: The Colorado Association of Campus Grounds Professionals needs you.

Established in December 1987, the association is an informational and educational assistance organization for college and university campus land-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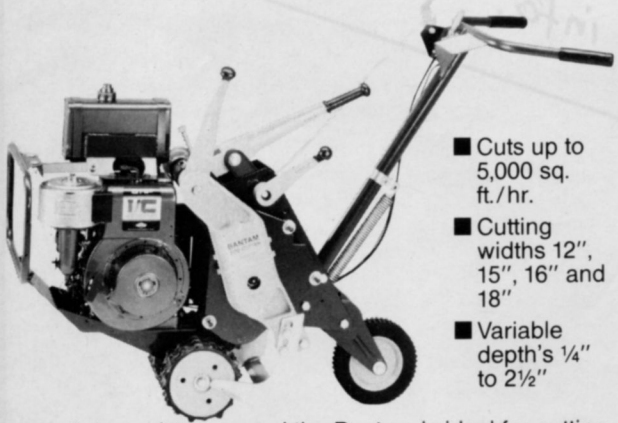

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scape management operators.

The organization is putting together its membership phone directory, newsletter and regular member campus meeting schedule and wants to include you. And remember, there are no membership fees.

For more information, contact Daryl L. Smith, Facilities Services, Colorado State University, Fort Collins, CO 80523; (303) 491-6564. □

ASSOCIATIONS

CLCA certifies maintenance

The California Landscape Contractors Association recently conducted its first certification tests for landscape maintenance personnel. It is the first certification testing for *maintenance* by a trade group.

The test fulfills the association's long-time goal of sponsoring separate field tests for landscape installation and maintenance. The maintenence test lasts two days. (CLCA has sponsored a certification exam for landscape installation for five years.)

The state requires all contractors to pass a written exam for installation, spokesman Larry Rohlfes says, but there is none for maintenance. CLCA exams are both hands-on and written. Applicants must prove their skills in the field under the eyes of industry experts.

John Nishizawa, chairman of the CLCA's Landscape Management Program, says the new test is designed to identify employees who have solid, all-around practical skills in landscape maintenance. "We believe those who successfully complete our test will soon get the industry recognition that Certified Landscape Technicians (those who pass the installation test) are beginning to receive." □

PRODUCTS

2 new products for landscapers

O.M. Scott & Sons has announced a pair of new products, Weedgrass Control 60 WP and ProTurf Fertilizer Plus Insecticide/Pre-emergent Weed Control.

Weedgrass Control is packaged in handy 1¼-lb. packets which contain a pre-measured amount of pendimethalin. It controls six sprouting grassy weeds and nine sprouting broadleaf weeds. It is for use on established Kentucky bluegrass, perennial ryegrass, fine fescue, tall fescue, *Poa annua*, Bermudagrass, St. Augustine, bahiagrass, zoysiagrass, centipedegrass and blends of these grasses. It's also compatible in the tank with most fertilizers and pesticides.

The fertilizer/insecticide/pre-emergence weed control product is formulated to:

- feed the turf;
- provide pre-emergence weed control of four sprouting annual grassy weeds and two sprouting annual broadleaf weeds; and
- control of armyworm, chinch bug, cutworm, sod webworm and the bluegrass billbug adult. □

LAWN CARE

Selling video now available

"Effective Lawn Care Selling," a video sales training program, was just released by Acme Ritz Productions in Columbus, Ohio. The course, designed by Rudd McGary, Ph.D. at All-Green Management Associates and Mike Hiller of Acme Ritz, is specifically for the lawn care industry.

The program costs $295.00. Included in the package are one video tape, one instructor's manual and one participant's manual. Additional participants' manuals are $9.95 each.

For more information, phone (614) 863-8586. □

Troubled waters?

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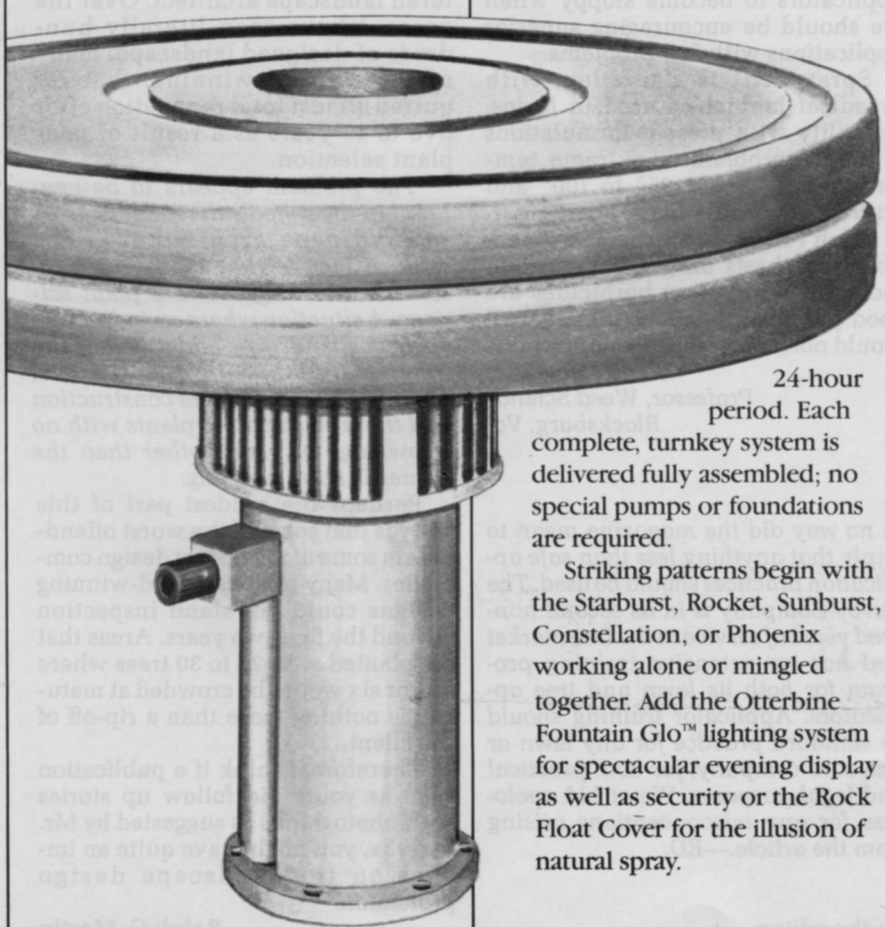
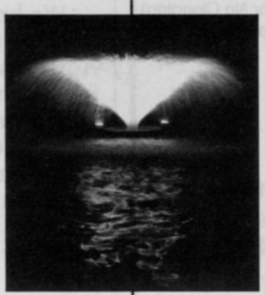
The prescription for troubled breathing, poor circulation, and changing temperatures in ponds and lakes is practical engineering that is esthetically pleasing.

These aerators range in power, circulating from 600,000 to 20 million gallons of water in a 24-hour period. Each complete, turnkey system is delivered fully assembled; no special pumps or foundations are required.





Striking patterns begin with the Starburst, Rocket, Sunburst, Constellation, or Phoenix working alone or mingled together. Add the Otterbine Fountain Glo™ lighting system for spectacular evening display as well as security or the Rock Float Cover for the illusion of natural spray.

Otterbine Aerators meet the water management needs of golf courses, parks, recreational lakes, office developments, and residential condominiums. Call or write for more information:

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Circle No. 132 on Reader Inquiry Card

LETTERS

To the editor:

The October 1988 LANDSCAPE MANAGEMENT contained an article, "Davey's research examines safety question," which in my opinion doesn't paint a very clear picture of the problems with broadleaf weed control herbicides.

It is very important that good application techniques are stressed and encouraged. First, these herbicides are foliar-absorbed by most plants and it is important to keep them off desirable plants. Second, dicamba is root-absorbed and must be kept out of the root zone of desirable plants. In the container plant study, no mention was made of damage to grape.

We know that April is not the best time to apply broadleaf herbicides. April is when new buds are developing on many ornamentals and trees, and these herbicides distort growth in these buds (the most sensitive stage). The damage is usually seen three weeks after application. We don't want to cause damage even though recovery does come in a few weeks or months.

This article leads less well-trained applicators to become sloppy when we should be encouraging superior applications with few problems.

Spray drift is a problem with broadleaf herbicides used in lawns. Volatility with present formulations is only a problem at extreme temperatures of about 95° to 100° and with ester formulations in particular.

I don't think that articles with relaxed emphasis on good application techniques for these herbicides are good publication practice. In short, I would not have published this article.

Wayne Bingham
Professor, Weed Science
Blacksburg, Va.

In no way did the magazine mean to imply that anything less than safe application practices should be used. The Davey Company is in its second hundred years of service to the tree market and has an extensive training program for both its lawn and tree applicators. Applicator training should be standard practice for any lawn or tree care company, for both practical and legal purposes. We at LM apologize for any misconceptions arising from the article.—ED.

To the editor:

As a long-time extension weed management specialist, I must compliment you on your *Pocket Guide* (October 1988). It is great! Just what our increasingly technical managers need.

As University of California budgets are diminished due to urban managers who think we should throw all our public resources at ppb (parts per billion) research, there is a good niche for you to provide what we used to provide—and do it better!

Privitization ain't so bad!

Harold M. Kempen
Farm Advisor
Bakersfield, Calif.

We are pleased with the success of our first Pocket Guide, and have begun to plan for others in 1989. Extra copies of the original Pocket Guide are available for just $5 each. To order, call Doug Dezso at (800) 225-4569.—ED.

To the editor:

The letter in the September issue by Robert E. Paryka was right on target. While I own and operate a tree service company, I have a degree in horticulture and I am a registered landscape architect. Over the years, I have seen literally hundreds of designed landscape, many of them award-winning, that required almost total renovation after five to 10 years as a result of poor plant selection.

The problem appears to be centered in the schools that offer degrees in landscape architecture. The strange fact is that many of these schools offer degrees in a plant science. A situation where an individual designs a landscape and specifies the plant material, both quantity and quality, specifies the bed construction and the installation of plants with no knowledge of plants other than the names is mind boggling.

Perhaps the saddest part of this story is that some of the worst offenders are some of the largest design companies. Many of their award-winning designs could not stand inspection beyond the first two years. Areas that are planted with 25 to 30 trees where five or six would be crowded at maturity is nothing more than a rip-off of the client.

Therefore, I think if a publication such as yours did follow up stories with photographs as suggested by Mr. Partyka, you might have quite an impact on the landscape design profession.

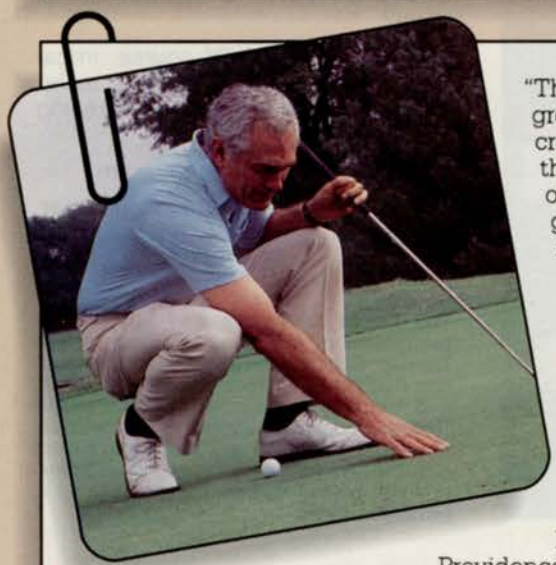
Ralph G. Martin
Tree Injections of Texas
Hurst, Texas.

BENTGRASS

"We planted the 12th hole on Singing Hills' Willow Glen Course to SR 1020 two years ago, and it performed admirably. What's really significant is that members keep asking what we've done to the 12th hole that makes it putt so well! The members like SR 1020's performance from the players' point of view; we like that too, but we also value that we haven't had to change our normal greens maintenance program to achieve the results."

David Fleming

David Fleming, C.G.C.S.
Superintendent, Singing Hills Country Club
El Cajon, CA



"The newer golf course greens planted to Penncross look beautiful, but they don't putt like the old South German Bent greens. The putting surface of those old greens is fine-textured, not thatchy or grainy, and the old greens don't show the spike marks like Penncross. We've been needing bentgrasses bred for golf quality as well as turf quality for a long time, and it looks like SR 1020 and Providence fill the bill!"

Peter Trenham

Peter Trenham
President, Philadelphia Section PGA
St. David's Golf Club
Wayne, PA

Finally! New Cultivars Bred To Meet the Needs of the Superintendent and the Golfer!

At Seed Research, we listen to your needs. You've been wanting a bentgrass that's tough, looks great, and is easy to maintain . . . but one that's also fine-textured, with good putting green quality. And available.

So when the bentgrass shortage became apparent in 1983, we acted quickly and acquired parental germplasm from two of the finest bentgrass collections in the country – the University of Rhode Island and the University of Arizona. From those collections, we developed two exciting new creeping bentgrass cultivars, Providence (SR 1019) and SR 1020.

Evaluation on golf courses and at universities has shown that both these bents produce the kind of turf you demand: dark green, aggressive, competitive, easy to manage, good disease resistance, good stress tolerance, and compatible with existing bents for overseeding.

And, for real golfers like Peter Trenham, SR 1020 has proven it provides everything desired in a putting green bent: fine texture, uniform surface, and most importantly, an absence of grain, so the ball holds the line for true putting accuracy.

SR 1020 is already in production, and excellent quantities of certified seed are available. Providence will be available in August of 1989. With either of our exclusive new bentgrasses, you can look forward to a good-looking grass that will give you the performance you demand and the putting green quality your golfers prefer!

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Circle No. 160 on Reader Inquiry Card

How to reduce the cost of weed control today, tomorrow and beyond:

George Toma, Kansas City's own world-class groundskeeper, insists that most of us already know everything it takes not only to reduce the cost of herbicide but at the same time to improve the overall quality of the turfgrass. He contends that we simply need to keep reminding ourselves of those things we already know. In this edited version of a recent visit with him, he reviews those basic reminders.

Everett Mealman, President
PBI/Gordon Corporation

Mealman: George, we hear reports from time to time that you say the best way to reduce the cost of weed control is to stop using herbicide.

Toma: Yes, I've said that. But it's like the duffer who, after a bad round, said he was going to quit playing golf — not immediately, of course, but gradually over the next 20 years.

Mealman: You think a groundskeeper can gradually break the habit of using a herbicide to control weeds?

Toma: Yes, providing he can also break his turfgrass from the habit of associating with weeds.

Mealman: In order words, a herbicide program that is so good it eventually kicks out all the weeds, and a grass-growing program so good that the weeds can't get back in.

Toma: You've got it! At the Truman Sports Complex we're almost doing that right now. Today, we use no broadcast pre-emerge or post-emerge on the ornamental turf and landscaped islands around either stadium. All we use is some TRIMEC® Plus to spot treat for an occasional broadleaf or grassy weed.

Mealman: But, George, is this a realistic goal for a commercial lawn and landscape management company?

Toma: Absolutely! Of course, irrigation is a must, and you have to be involved in the sodding and seeding and fertilizing.

Mealman: What is the program?

Toma: Program isn't the right word. It's following through on the three

The Super TRIMEC treated turf on the perimeters of Arrowhead Stadium at the Truman Sports Complex is so immaculate that many visitors actually get down and feel it to find out for sure if it's real. George Toma tells Everett Mealman that the day he doesn't get a charge out of running his fingers through immaculate turf will be the day he hangs it up as a groundskeeper.

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Super

basic fundamentals of cleaning up; keeping up; and building up.

Mealman: Can you enlarge on that?

Toma: Early spring is an excellent time to clean up . . . to clean out every weed, down to the very last root hair, so the turfgrass has a chance to thicken up. Whenever I am cleaning up some turf, I use Super TRIMEC® turf herbicide. I've never found a herbicide that does such a thorough job and yet requires such a small amount.

A big part of keeping up involves the green color you want in the spring and summer, and I always caution against using nitrogen during the growing season. Too much nitrogen in the spring and summer will result in too much top growth that weakens the roots and invites disease. To get color in the late spring and summer, I use Ferromec® Liquid Iron. Every year when they televise the Super Bowl, the announcers always rave about the beautiful color . . . that's no accident . . . that's Ferromec!

The time to build up is in the fall. That's when I pour on the fertilizer — and, if I reseed, I spray on Bov-A-Mura® (Natural Organic Activator). It does an excellent job of helping new seeds build strong roots . . . and I always use it whenever I lay new sod.

Dr. Jan Van Diepen shows a printout of a radioisotope tracer study to Everett Mealman and George Toma. The purpose of such studies is to determine the smallest possible amount of the strongest possible chemical formulation that can translocate to the root system of a weed and result in total control. Toma says, "We constantly test herbicides, and nothing is as efficient as Super TRIMEC."

Facts turf pros should know about Super TRIMEC

Super TRIMEC is a remarkable breakthrough in herbicide chemistry. To make it, we combine several esters with dicamba in a synergistic and homogenous complex in which every droplet is an exact mirror image of the total. No one except PBI/Gordon has ever been able to do this.

The esters have unparalleled penetrating power, which enables the complex to get through the cuticle and into the circulatory system of even the toughest weeds far more rapidly than other types of formulations. And once Super TRIMEC gets into a weed . . . that weed is terminal . . . period!

But please note: The dicamba in Super TRIMEC is in acid form and is virtually insoluble in water. Therefore it is less likely to migrate in soil and endanger off-target ornamentals.

Because Super TRIMEC is so powerful, one gallon will cover four acres. And yet the spectrum is so broad that it controls even such tough species as ground ivy, oxalis and spurge.

The benefits of Super TRIMEC

1) **You can start earlier in the season:** Super TRIMEC gets into the weed so quickly that neither a sudden rain nor a quick freeze is a threat. This allows you to start earlier in the year.

2) **Dramatically reduces the need for retreatments:** Super TRIMEC does it right the first time. Saves time and labor.

3) **Reduces herbicide costs:** You use less herbicide per acre and you spray fewer times per year. Both your weed control and your profits are better.

4) **Friendly to the environment:** Super TRIMEC uses less chemical. One gallon will treat four acres.

Yes, Super TRIMEC is a low-volatile ester. Yes, Super TRIMEC is labeled for professional use only. But you *are* a professional. Utilize your professionalism to increase your profits.

If you have any questions about Super TRIMEC, please call us.

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716-1288

Reid is new President of Jacobsen

Robert W. Reid, Jr. has been named president of the Jacobsen Division of Textron, Inc. Reid joined Jacobsen in 1987, and was appointed vice president of marketing in early 1988.

Reid was previously with Outboard Marine Corporation as a senior manager. He has served with Lawn Boy and other turf, commercial and marine product companies, as well as Kimberly-Clark, in various market research and product management posts.

Robert Reid

Martin McGinn has formed McGinn and Associates, a New Jersey-based consultant firm to provide research and solutions to the current and continuing problems facing turf companies and associations.

Long at the forefront of many of the industry's technological advances, McGinn was a pioneer in the formulation and introduction of the first fungicide to be packaged in a water-soluble bag and he has provided much manufacturing expertise in dry-flowable formulations.

McGinn is joined by his two sons, **Michael**—an insurance broker versed in product liability cases—and **Matthew**—an advertising executive.

Cheryl Van Vliet has resigned as communications director and trade show liaison for the Outdoor Power Equipment Institute to serve as marketing director for S & S Graphics, Inc., a printing concern located in Rockville, Md. While with OPEI, Van Vliet coordinated various seminar and promotional activities, and planned the institute's annual meetings.

Ken Chatham was recently elected president of the Metropolitan Atlanta Landscape and Turf Association. Chatham, president of Crabapple Nursery & Landscaping and Sudden Shade, is a member of the American Association of Nurserymen, Garden Centers of America and other organizations.

Immediate past president, **Roger Bregenzer,** will serve as chairman throughout 1989.

Other Malta officers are:

Rich Cordery, vice president; **Spence Rosenfeld,** secretary; **Jim Lanier**, treasurer.

Michael Kelty

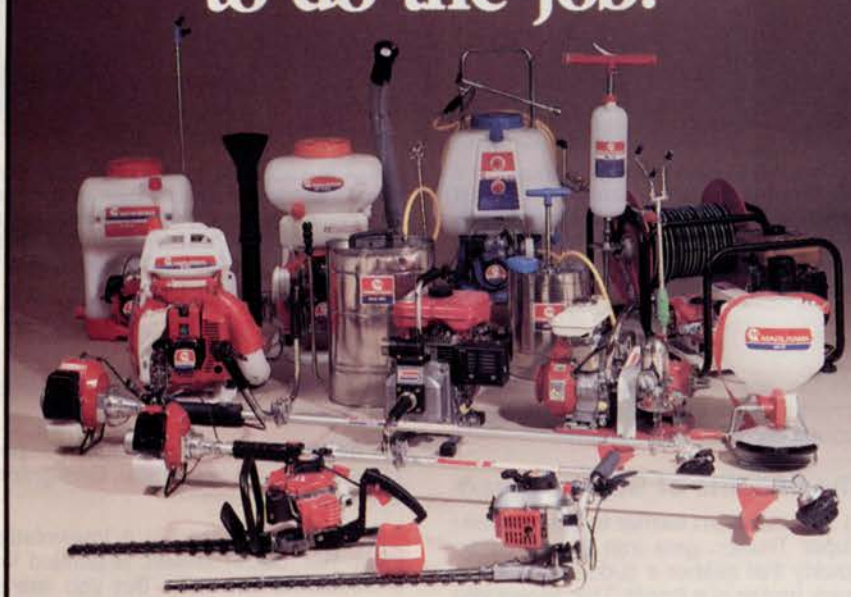
Michael Kelty has been named director of research and development for O.M. Scott & Sons.

Kelty joined the company in 1979 as regulatory environmental specialist. He had been director of chemical technology in 1987.

The National Roadside Vegetation Management Association has named the winners of its 1988 "Excellence in Roadside Vegetation Management Award."

William D. Johnson, Raleigh, N.C., won in the state category; **Bill H. Tidwell,** Anaheim, Calif., won the county contest. **Mayor Jerry E. Abramson** of Louisville, Ky. and the City of Boca Raton, Fla., tied for first place in the municipal category. **Dr. Ray Dickens** of Auburn University was the winner in the academic category.

Are you fully equipped to do the job?



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- **Water Pumps** — Three models, 32gpm to 132gpm for irrigation or moving murky water.
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- **Granule Spreader** — 18 ft. range, dry chemical or seed, with tank agitator to bust up clumps.
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- **Soil Injectors** — For precise injection of chemicals.
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756
JOHN DEERE

The winning team 80 million people won't see at Super Bowl XXIII

Gary Morris and his John Deere turf team. Because most of their work will be done when the TV cameras come on—just as it has been all season at Miami's Joe Robbie stadium. Gary Morris supervises grounds care at the stadium. John Deere helps.

"We have 15 pieces of John Deere equipment that help us take care of the stadium inside and out," says Morris. "Everything from the 756 Turf Mower that cuts the field every day to an F935 Front Mower, 855 Tractor, 232 Aerator, 151 Vacuum, two AMT® 600 Transports and five rotary walk-behinds.

"The cutting units on the 756 are perfect for this kind of work," Morris says. "They deliver an excellent cut and stand up to a lot of abuse. When you're using a stadium for rock concerts, tractor pulls, and moto-cross races in addition to football games, you need something tough. I've seen the 756 cut right through coins and nails—things that would have ruined other mowers.

"Our most valuable machine is our 855 Tractor," he adds. "It saves us a lot of time by allowing us to use the loader and mower at any time without having to unhook the other one first. It's always ready to work."

Your John Deere turf distributor is always ready to work, too. Talk to him today, or write John Deere, Dept. 956, Moline, IL 61265 for a look at the full line of equipment designed to make your team a winner, too.

A John Deere 756 Turf Mower works daily at Miami's Joe Robbie stadium—site of Super Bowl XXIII.

JOHN DEERE

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COVER STORY

SUPERINTENDENTS ON COURSE

Our 1988 survey results tell us what we've known all along. Today's supers are exactly that.

by Will Perry, managing editor

"We can deal with the weather. We can take care of the turf and the weeds on our course. It's the people we're having trouble dealing with."

That's the synopsis gathered from *Landscape Management*'s year-end survey of America's golf course superintendents. And the people they're concerned about? For many it's their customers— the golfers. For others, it's their personnel— both full and part time, who seem as willing to change jobs as they are their shoes.

Almost 40 percent of our respondents cited the hack golfer and/or low level crew personnel as their primary nemesis. "There are too many poorly educated golfers out there who haven't been properly instructed in the area of course etiquette," says a veteran Oregon superintendent in his second season at a public course.

"Trying to get players to keep their carts off the fairways" is my biggest problem, responded another, adding that he's frustrated trying to "educate players about the use of disposable containers on the course. They're totally inconsiderate of property."

For most respondents complaining of difficulties arising from golfers, this lack of etiquette means ball mark and divot control, a general inconsideration of course property and improper golf cart use, which one super described as "our biggest source of revenue and our biggest source of problems." For others, the problem lies in the golfers' expectations. "Too much is expected by golfers," says an Illinois superintendent who has been at it for 10 years. His course, which is privately owned and has restricted membership, manages 18 holes on an annual budget of about $520,000.

Employee management, particularly motivation, cropped up as a primary concern. In parts of the country where unemployment levels are low, supers are finding it difficult to attract quality lower-level employees. "We have 3½ percent unemployment in our area," says the super of a private course in New Jersey, adding, "Big money is almost not a factor" when trying to attract employees.

Another major concern of supers is their annual budgets, which many feel don't grow in proportion to the type of course greens committees anticipate.

A Michigan superintendent cited his biggest problem as "Trying to produce a course comparable to those

Landscape Management Survey Averages

Length a superintendent ..... 11.25 years

Length at current course 6.9 years

Geographical distribution

Northeast	20%
Southeast	13%
Midwest	48%
Southwest	8%
Plains/Mountains	6%
Far West	5%

Type of course

Public	18.8%
Private	29.2%
Restricted membership	37.5%
Resort	16.7%

Number of holes

Nine	16%
Eighteen	73%
Twenty-seven	9%
Thirty-six	1%
More than 36	1%

Average number of rounds per week

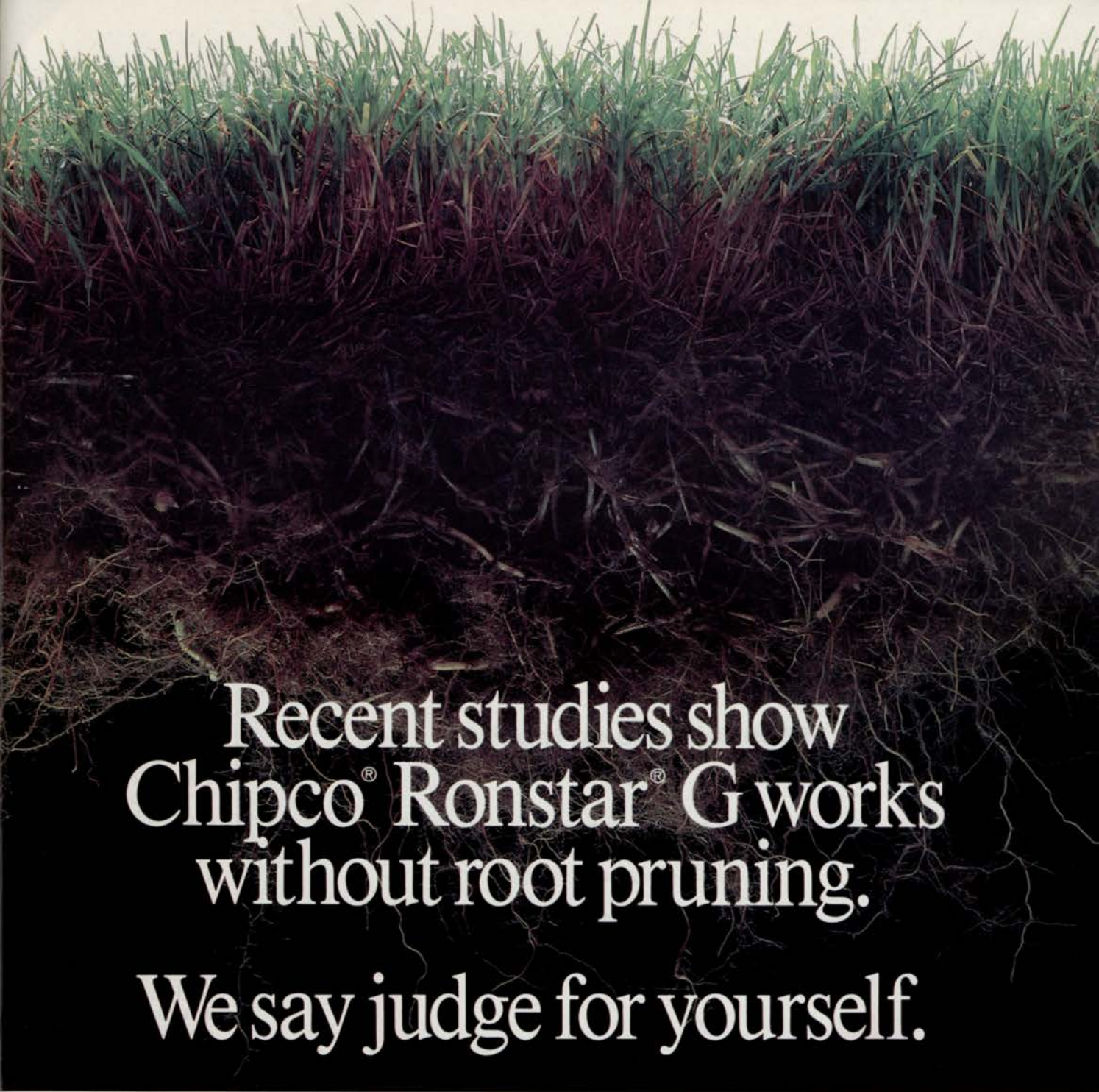
Spring	1,454
Summer	2,122
Winter	1,545
Fall	827

Average maintenance budget

1987	$254,334
1988	$297,120
Anticipated 1989	$334,114

Average Crew Size

Full time	7.25
Part time	5.83



Recent studies show Chipco® Ronstar® G works without root pruning.

We say judge for yourself.

Let's face it, the last thing you need from a turf herbicide is root damage. That's why so many golf course superintendents are making CHIPCO® RONSTAR® brand G herbicide their first choice for broad-spectrum weed control. Root pull studies conducted at a leading university show that CHIPCO® RONSTAR® G herbicide works without pruning turf roots. That's important, because healthier roots mean stronger, more durable turf. Turf that stands up better to stress. Best of all, just one pre-emergence application of CHIPCO® RONSTAR® G provides season-long control of 25 tough broadleaf and grassy weeds —including goosegrass and crabgrass. You'll also appreciate the fact that CHIPCO® RONSTAR® G won't leach out or move laterally through the soil. And it's labeled for use on a wide variety of ornamentals. So you can apply it to ornamental plantings at the same time you do your turf. You'll get up to 120 days of weed-free control.

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Circle No. 155 on Reader Inquiry Card

seen on television with a budget that is not large enough to deal with 45 acres of bentgrass fairways." The 1989 budget on his 18-hole private course is $200,000, up from $180,000 in 1988.

Several supers cited the lack of available monies to improve irrigation and meet the rising costs of equipment and personnel as a problem. Said one: "Working on a private membership course, it is hard to get the money needed to improve equipment and irrigation. They [owners] are satisfied with what they have and won't attempt to grow and improve."

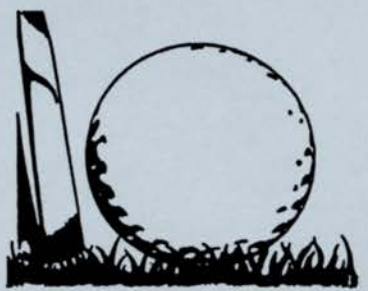
Budgets are growing

Though comparing golf course budgets is essentially a meaningless task, it is encouraging to note that survey results showed a steady increase in course budgets since 1987. At that time, supers reported working with budgets around $255,000. In 1989, that range will fall in the area of $335,000, up from $297,000 in 1988.

And what will supers be doing with the extra dough? Many (68%) said they're planning on improving their irrigation systems. Not surprising since 34% said they're using older quick-coupler or automatic systems with limited controls.

Problem Diseases of Golf Turf

Dollar Spot	63%
Brown Patch	56%
Snow Mold	35%
Leaf Spot	38%
Pythium	54%
Others	17%

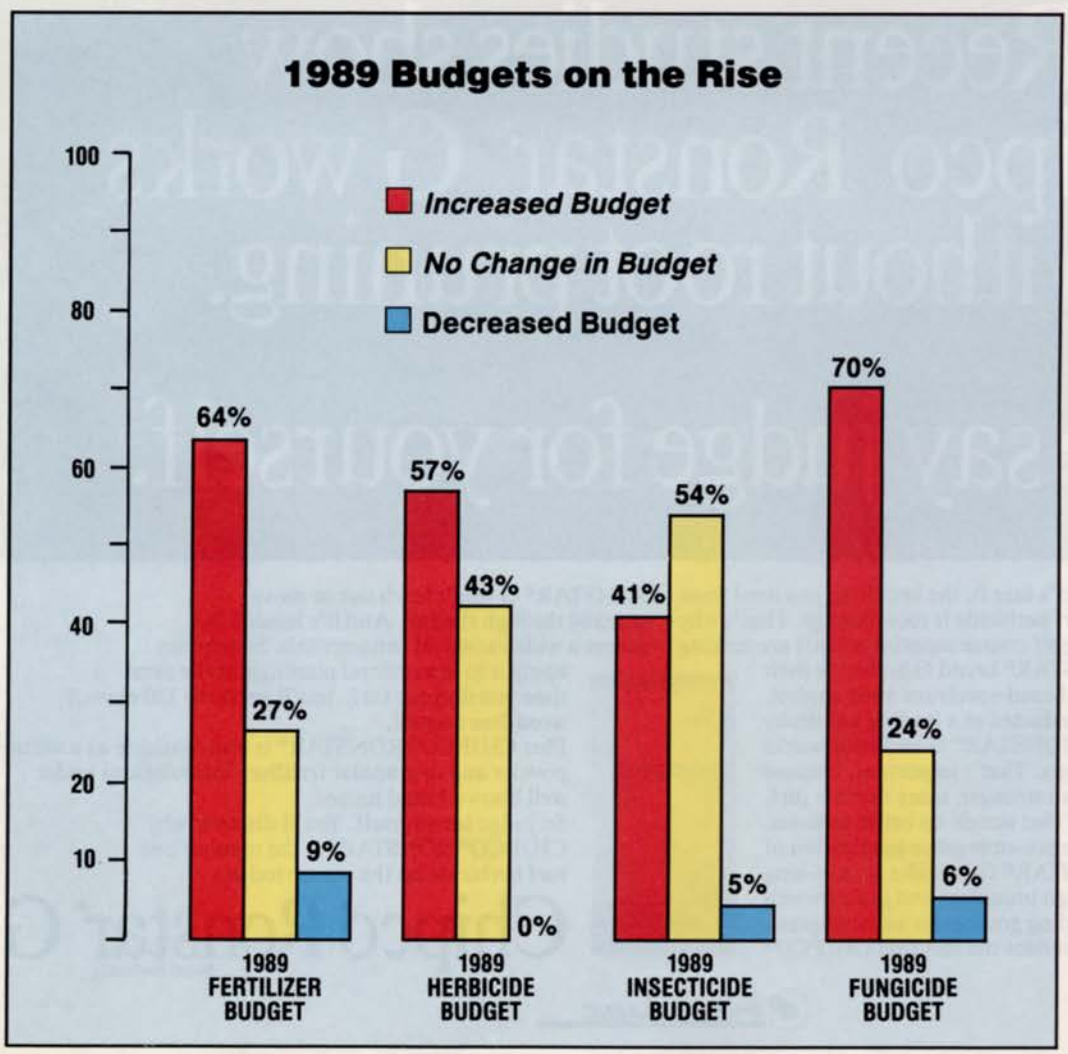


In general, supers reported their budgets for fertilizers, herbicides and fungicides have steadily increased in recent years, while insecticide budgets have grown at a slower clip. Sixty-four percent reported an increased fertilizer budget in 1989, compared to 28% who cited no increase. An anticipated increase in herbicide expenditures in 1989 was reported by 57% of the respondents and 69% said the same of their fungicide budget. Fifty-five percent reported no change in their anticipated 1989 expenditure for insecticides.

The major turf weed problems these supers face are dandelions (30%), crabgrass (30%) and clover (27%), which they fight with $8,113 worth of herbicides. As far as insects are concerned, grubs were the major problem (33%), followed by sod webworms (17%) and armyworms (10%). Chinch bugs, mole crickets and nematodes were also cited as problem insects. The respondents reported an annual insecticide budget of $4,915.

As for who supers will look toward when they're deciding where to spend that money? It appears they'll be looking at each other. When rating buying influences, nearly all of the responding supers rated other supers as either very important (49%) or important (46%) as a buying influence. Association information also ranked well, followed by distributor advice, magazine articles and extension agents.

There are a few noticeable trends that emerge when one pours over these survey results. One is that supers are being asked to do more than ever before. Their responsibilities are growing with the ranks of golfers. Also, the management of turf areas alone is no longer enough. The best supers need to be effective as a "people-manager", also. **LM**



THIS MOWER CHANGED WALKING GREENSMOWER TECHNOLOGY FOREVER.

If you think advances in greensmower technology have leveled off, prepare to take off. The Bunton triplex is not only *new*, it's *better*. We started with fresh ideas and state-of-the-art technology and developed a truly well-engineered machine where every feature produces performance.

STARTING WITH FRESH IDEAS MEANT THE END TO COMPROMISES.

The Bunton triplex is light on its feet, yet heavy-duty in construction. Until now every greensmower ever built was a compromise designed to keep total machine weight down, to reduce turf compaction, at the expense of heavy-duty construction. Rather than striving to reduce total machine weight, our engineers concerned themselves with the pressure actually transferred to the surface. The result is more durable components that improve cutting performance. That means better greens surfaces... and for a longer time.

THE SOLUTION TO TRADITIONAL GREENSMOWER PROBLEMS.

We started by putting weight where it does some good. Our larger reel motors and counterweights sit solidly on the playing surface to eliminate bounce and produce a truer, more consistent cut. The unique traction wheel design allows more tire surface area to meet the green, to keep ground surface pressure low. Interchangeable parts keep inventories low and maintenance simple. Better performance results from a true hydrostatic transmission and dynamic braking, welded steel frame construction, extra oil filters, independent reel operation, standard backlapping, and a powerful 18 hp Onan engine or optional 16.5 hp Kubota diesel.

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Patriotic colonists really started something when they threw packages of tea into Boston Harbor back in 1773. Today, DURSBAN* 50W in water-soluble packaging is starting a new revolution in simple and convenient insecticide handling.

In handy 4-oz. packets that dissolve quickly and completely in water, DURSBAN 50W eliminates many problems which have been bugging lawn care operators for years.

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- **No operator exposure.** The chemical stays in the packet.
- **No measuring.** Each pre-measured packet holds exactly 4 ounces; no chance for error.
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Just convenience... and lasting efficacy. No turf insecticide controls a broader spectrum of surface-feeding insects than DURSBAN 50W. And because it's a wettable powder, it keeps working longer than emulsifiable concentrates... without their solvent odor. And DURSBAN 50W has an established human safety record.

Join the revolution. Throw over your old insecticide and switch to DURSBAN 50W. Eight 4-oz. water soluble packets in a childproof fiber container.

DURSBAN* 50W
TURF INSECTICIDE

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The Dow Chemical Company

Attention: Always read the label before use and carefully follow all label directions and precautions.

Circle No. 112 on Reader Inquiry Card

ROOM TO BREATHE

That's what aeration is all about. And to do it right, use hollow tines when the turf is active.

by Terry McIver, associate editor

Aerate cool season turf in early spring or early fall. Warm season grasses are best aerated in late spring.

Core aeration remains the best single cure for the respiratory ills caused by the triple threat of soil compaction, thatch and interfacing soils.

Proper and timely aerification assures that the turf completes the season in a healthy soil base and can breathe easier. The effectiveness of fertilizers and pesticides is upgraded, and overseeding into established lawns can be done without destroying existing grass.

"Aeration of the soil is an exchange of gases between the ground and the atmosphere," says Paul Rieke, Ph.D. at Michigan State University. "It's also a practice of cultivation that helps to improve the root system.

"The goal of aerating is to create a better environment, a favorable growing medium for seed and established turf."

Impact on compaction

In soil containing shallow layers of compacted or incompatible soils, coring reopens a channel between soil layers, removes a portion of the problem soil and permits top dressing and refilling with more compatible material.

"Core aeration is the best way to improve the soil's oxygen diffusion rate," says Robert Morris, area specialist in commercial horticulture at the University of Nevada.

Morris explains that soil normally consists of micro and macro pores. Micro pores contain water; diffusion occurs in the macro pores. "But when soil is compacted," says Morris, "the

An analysis of solid tine aeration

Recent aeration research by Robert Carrow, Ph.D., University of Georgia, tends to support the belief that solid-tine coring is less effective as a turf cultivating procedure.

Carrow has been studying the effects different cultivation techniques have on surface compaction, root progression at varied depths and water extraction. Four aeration methods were studied: deep-drill coring, slicing, hollow-tine coring and shatter-core.

"Our soils in southern Georgia are high in clay content," explains Carrow. "Typically those soils are highly subject to surface compaction, and harden quickly when dry, making root progression difficult."

Carrow experimented on Tifway Bermudagrass, one of the most common grasses for use on recreational fields. Tifway is one of the most tolerant grasses when it comes to compaction, so Carrow believed the results would be very evident.

These were the general results:

In the 8- to 24-inch zone, the Aerway slicer enhanced rooting from 53 to 120 percent; the deep drill, 31 to 55 percent; hollow tine, 20-35 percent. The solid tines did not improve deep rooting within the 8- to 24-inch zone, but the solid tine sample tended to have higher roots in the 4- to 8-inch zone.

Carrow next tested for water extraction (how much water the roots extract from the zone) during a dry-down period, from 0 to 24 inches.

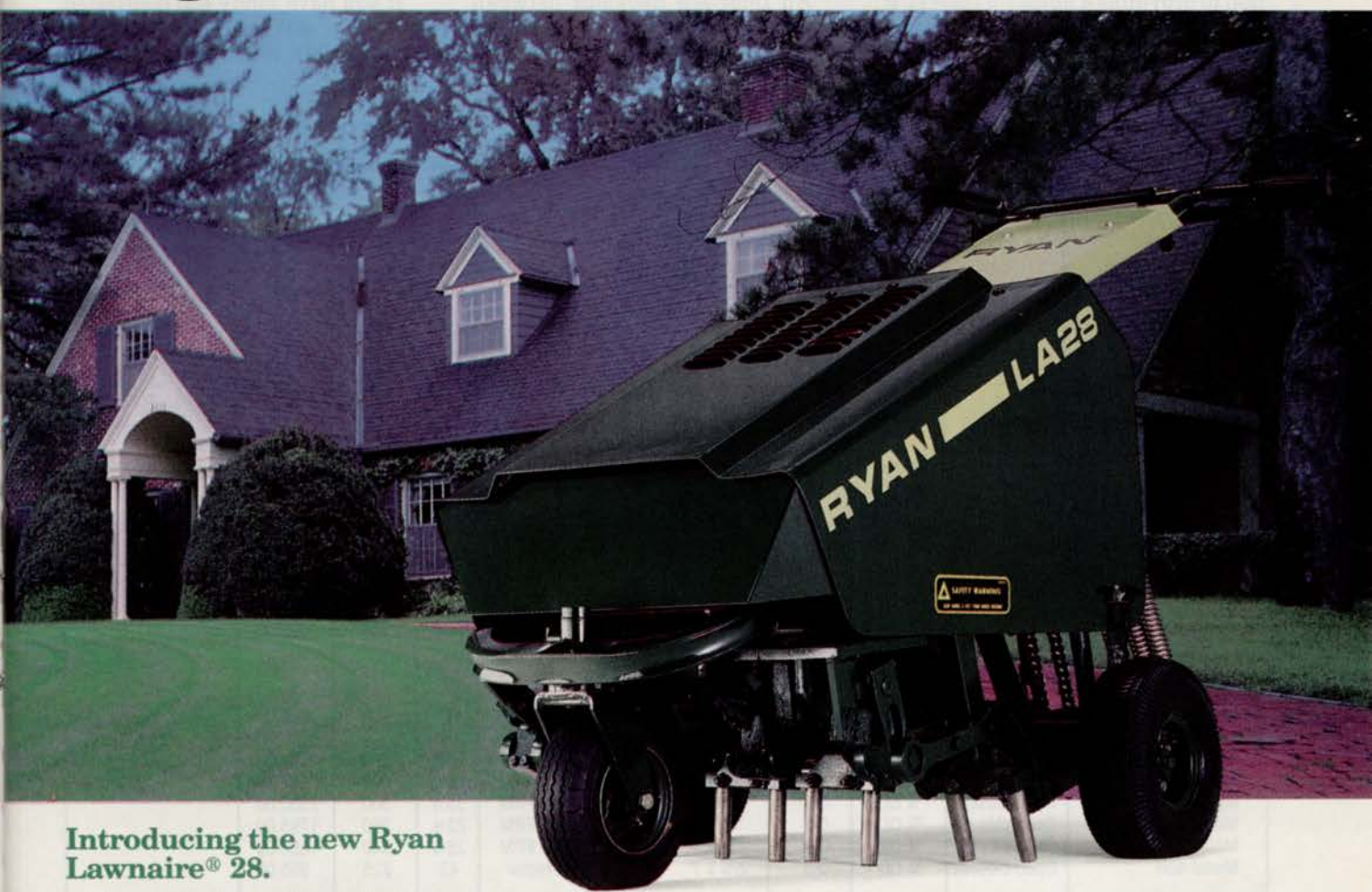
"The deep drill, Aerway slicer and hollow tine aerator all improved water extraction, but the solid tine did not," says Carrow. We see the plant extracting more water from deeper in soil where there are more favorable water relations."

Carrow's findings should apply to a variety of turf. "Remember, our red clay soil has more than the usual amount of surface compaction."

—Terry McIver □

Robert Carrow: His research at the University of Georgia Tends to support the belief that solid-tine coring is less effective as a turf cultivating procedure.

Ryan brings quality aeration from golf greens to green lawns.



Introducing the new Ryan Lawnaire® 28.

The revolutionary Lawnaire 28 combines the technology and precision of golf course aeration with the demands of lawn maintenance. Its reciprocating, crank mounted tine arms feature a vertical coring action similar to larger Ryan aerators. Tines penetrate straight in to a depth of 2½ inches, and come straight out. The results are a more professional-looking job, better root development, greener lawns, and more satisfied customers.

Make more money by the yard.

Because time is money, the Lawnaire 28 is designed to cover big jobs quickly — up to 24,000 sq. ft. per hour. But because not every job is big, it's also compact and maneuverable. Just 34 inches wide, the Lawnaire 28 easily fits through yard gates. The unique tricycle front wheel gives the unit a zero turning radius while aerating!

Even the tightest spots are no problem. And because it's a Ryan, you can rest assured that the Lawnaire 28 will keep you on the job and out of the repair shop for years to come.

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macro pores are destroyed, and all that remains are water-laden micro pores. Since water is extremely dense, air takes approximately 100 times longer to diffuse through the micro pores. The more porous the soil, the greater the likelihood of a healthy root system."

When thatch attacks

Thatch accumulation presents a variety of cultivation problems. In addition to providing a home for insects, it becomes a temporary but poor growing medium for new seed, resulting ultimately in a poorly rooted generation of new grass.

Combating soil interface

Interfacing occurs when soils with unlike physical properties collide, obstructing water flow.

Doug Chapman, horticulturist for Dow Gardens, Midland Mich., says interfacing also affects the depth of the root system, and indicates layering.

"An interface develops between either the native soil type, sandy ground and topdressing, or, if thatch is present, between the ambient soil, thatch layer and top dressing material," explains Chapman, who presents a scenario in which one problem leads to another:

"Let's say you have thatch covered by a layer of sand. The thatch will have a broken column, and capillarity will not occur. All moisture and root growth stops at that layer.

"If you have sandy soil contrasted with richer soil, or if you top dress with complete soil, the roots might

CORING AERATORS

COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
BRINLY-HARDY CO.										
CA-360	Spoon	6.25 x .93	2	6	Tow	2-6 MPH	41.75	84	185.00	
CLASSEN MFG. INC.										
Model 800-24	Open-closed	½ MIB, ⅝ OD ¾ OD	03-¾	Variable 1 x 2 to 5 x 2	Tow	0-250 FPM	49	750	5925.00	
Model 450	Open-closed	¼, ⅜, ½ & ⅝	0-3	2 x 2	Walk	100 FPM	32	450	3900.00	
Model 500ATC	Open-closed	¾ OD	0-3	6 x 3	Walk	200 FPM	28½	310	2785.00	
Model 500	Open-closed	¾ OD	0-3	6 x 3	Walk	200 FPM	28½	300	2360.00	
Model 600	Open-closed	¾ OD	0-3	6 x 6	Walk	200 FPM	35½	300	2360.00	
Model 400	Open-closed	¾ OD	0-3	6 x 6	Walk	200 FPM	22½	250	1795.00	
Model 36R	Open-closed	¾ OD	0-3	4 x 7	Walk	225 FPM	28½	340	1550.00	
Model 48R	Open-closed	¾ OD	0-3	5¼ x 7	Tow	Tractor	42	225	995.00	
CUSHMAN - RYAN										
Lawnaire 28	Hollow	⅞ x 4¼	2½	3½ x 5	Walk	24,000 FPH	34	400	3500.00	
Lawnaire IV	Hollow	⅞ x 7½	0-22¾	3¾ x 7	Walk	21,000 FPH	28	215	1560.00	
Lawnaire 3 pt	Hollow	⅞ x 7½	0-4	6 x6	Tow	0-10 MPH	46	500	1270.00	
DEDOES IND.										
Model A Trailer	Hollow	⅜, ½, ¾ dia.	2⅝-3⅛	2½ x 2½	Tow	0-10 MPH	60	600-800	5334.00	Available in 2-3 drum units
Model H	Hollow	¾, ½, ¾ dia.	2⅝-3⅛	2½ x 2½ 4 x 4	3 Pt. Tow	0-10 MPH	72	500	3321.00	Available in 2-3 drum units
Model B Trailer	Hollow	⅜, ½, ¾ dia.	2⅝-3⅛	2½ x 2½ 4 x 4	Tow	0-8 MPH	57	400	3067.00	Available in 2, 3, 4 drum units
Model L Disk	Hollow; Taper/open	¾ x 3	3	6 x 6	Tow	0-10 MPH	72	410	2339.00	Available in 5-7 disk units
Model K Disk	Hollow	¾ x 3	3	6 x 6	3 Pt. Tow	0-10 MPH	42	320	1954.00	Available in 5-7 disk units

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Mike Zedreck
Grounds
Superintendent

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not grow well, and you may have to water more frequently. If it happens to be a thatch interface, it might dry out and then you have to re-wet it. If it gets completely dry, you can't re-wet it without a detergent or surfactant or other wetting agent."

Aerate when it's active

Experts agree that aeration must be practiced only when the turf is active and able to bounce back from treatment.

Carrow at Georgia suggests that commercial turf might require more attention after coring.

"If you aerify too soon," warns Chapman, "the root systems are disturbed, and fill-in may not occur.

"If you core in early spring and don't have strong grass or turf activity, it won't start filling in until after weed season starts, which by then is too late."

"The question of when to aerate is related to the spring root die-back phenomenon," says Robert Shearman, Ph.D. at the University of Nebraska.

"When the plant initiates top

CORING AERATORS

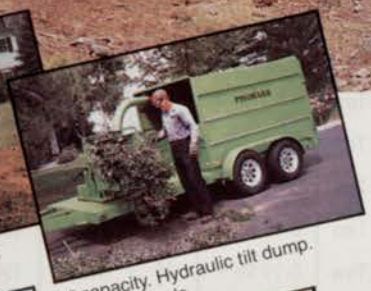
COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
JOHN DEERE CO.										
Model 270	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	3 Pt. Tow	7.5 MPH	74	680	2872.00	
Model 132	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	Tow	7.5 MPH	34.5	540	1543.00	
Model 232	Open-closed	½ x 8½; ¾ x 8½	1¼	5½ x 4	3 Pt. Tow	7.5 MPH	34¼	500	1212.00	
FELDMANN ENGINEERING CO., INC.										
2340-48	Spoons	4¾ x ¾	2½	9 holes per sq. ft.	Tow	Varies	48	118	409.50	
2340-32	Spoons	4¾ x ¾	2½	9 holes per sq. ft.	Tow	Varies	32	85	309.50	
GANDY CO.	Welded spikes	2½ dia.	1¼	6 Ctr	Hitch	N/A	24	350	N/A	
GREEN CARE INT'L.										
CoreMaster 12	Hollow	¼, ½, ¾, ⅝	0-3¾	1 x 1¼, 1 x 2, 2 x 1, 2 x 2, 2 x 3, 2 x 5	Tow	Up to 30,000 FPH	48	800	8495.00	
HAHN, INC.										
TMV	Open-closed	8½ x ¾	9-3½	5 x 7	Ride	0-4½ MPH	33	700	4300.00	
TB-140	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	90	954	3970.00	
TM-140	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	74	675	2995.00	
TB-60	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	34	550	1645.00	
TM-60	Open-closed	8½ x 1	0-3½	5 x 7	Tow	0-10 MPH	34	500	1310.00	
EA-3	Open	7 x ½	0-3	5 x 7	Walk	0-3 MPH	25	166	895.00	

Model PAL
Aerial Lift/Trailer (top)

Model 400
Log & Brush Chipper (center)

Model R-18
Stump & Root Grinder (bottom)

Full vision cutting. 22" wide.
Hydrostatic drive.



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it does so at the expense of the root system. Carbohydrates in the root system move toward the topgrowth, resulting in some slowing, and possible dieback of root growth. Once topgrowth reaches equilibrium, it starts to regenerate itself."

The aeration timetable differs according to turf type. Cool-season turf is best aerated in early sring and early fall, when the grass is growing vigorously and has ample time to recover from the aeration before dry weather or frost.

Chapman suggests aerating Northern grasses in late August through September. "If you're spreading preemergence herbicides, and doing a lot of other things to prepare the turf, you can justify aerating in early spring," assures Chapman. "However, commercial landscape, in which the grass grows from 2½ to 3 inches, is a different situation."

Carrow at Georgia suggests that commercial turf might require more attention after coring.

Warm-season turf should be aerated during the late spring and early summer.

Frequency of aeration depends on the landscape, volume of traffic and type of soil. Says Chapman. "If the turf receives moderate traffic, and you have sandy soil, once a year is suffi-

CORING AERATORS

COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
JACOBSEN										
590	Slicing	4-6	4-6	7 Ctr	Tow	0-10 MPH	72	1240	2729.00	
590	Open	½-¾	4-6	7 Ctr	Tow	0-10 MPH	72	1240	2729.00	
590	Closed	½-¾	4-6	7 Ctr	Tow	0-10 MPH	72	1240	2729.00	
595	Slicing	4-6	4-6	7 Ctr	Tow	0-10 MPH	48	1018	1989.00	
595	Open	½-¾	4-6	7 Ctr	Tow	0-10 MPH	48	1018	1989.00	
595	Closed	½-¾	4-6	7 Ctr	Tow	0-10 MPH	48	1018	1989.00	
LESCO										
Aerator - 30	Open-closed	6 x ¾	2-4	5½ Ctr	Walk	2.5 MPH	30	254	965.00	
OLATHE										
88	Closed	7⅜ x ⅝	0-3	3 3/16-9½	Walk	3½ MPH	32.5	295	1450.00	
SALSCO										
FTA-60-24	Hollow	¼-¾	4	2¼ x 2¼	Tow	Varies	84	1200	10,838.00	Seven tine sizes are available
30-12	Hollow	¼-¾	4	2¼ x 2¾	Walk	1 MPH	30	300	5064.00	Seven tine sizes are available
30-65	Hollow	¼-¾	4	2¼ x 4½	Walk	2½ MPH	30	300	4304.00	Seven tine sizes are available
30-6	Hollow	¼-¾	2¾	4½	Walk	2½ MPH	30	300	3531.00	Seven tine sizes are available
SNAPPER CO.										
PP-5000	Open-closed	¾ OD 9/16 ID	0-2	4 x 7	Walk	17,200 FPH	16	175	1195.00	

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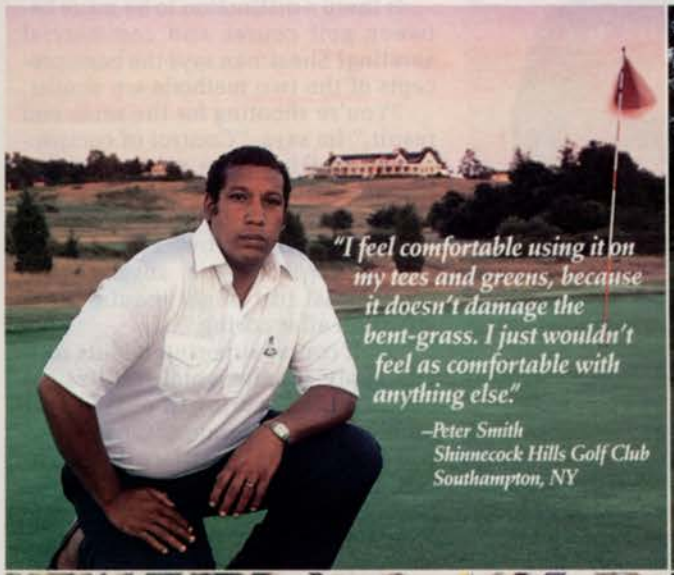
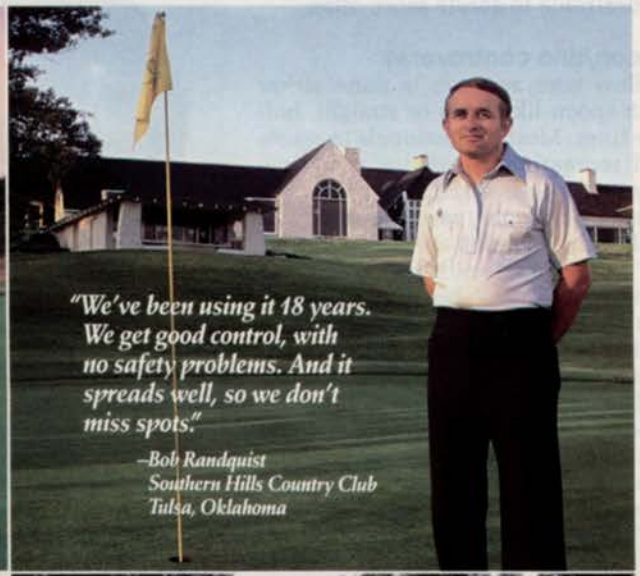
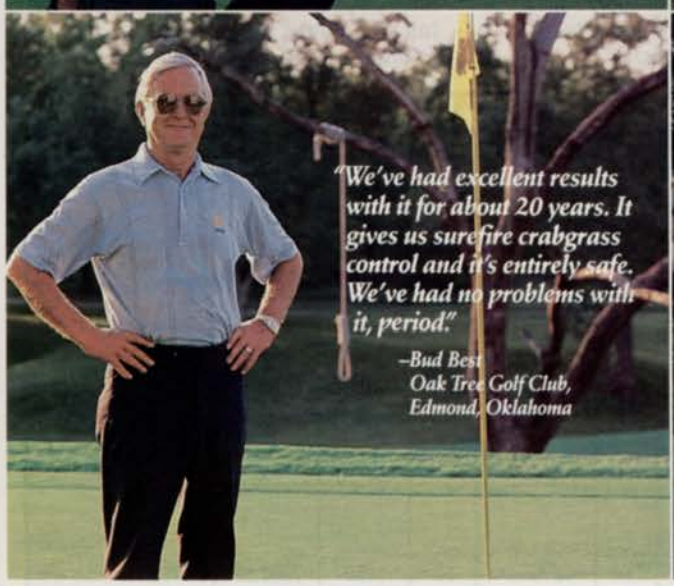
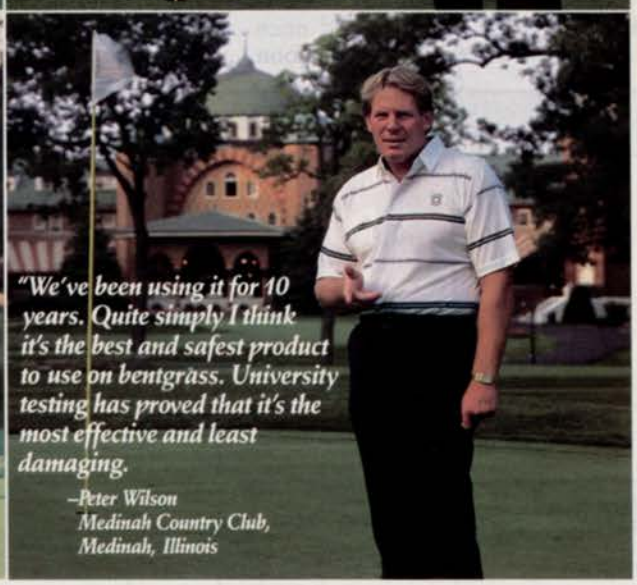

"I feel comfortable using it on my tees and greens, because it doesn't damage the bent-grass. I just wouldn't feel as comfortable with anything else."
–Peter Smith
Shinnecock Hills Golf Club
Southampton, NY


"We've been using it 18 years. We get good control, with no safety problems. And it spreads well, so we don't miss spots."
–Bob Randquist
Southern Hills Country Club
Tulsa, Oklahoma


"We've had excellent results with it for about 20 years. It gives us surefire crabgrass control and it's entirely safe. We've had no problems with it, period."
–Bud Best
Oak Tree Golf Club,
Edmond, Oklahoma


"We've been using it for 10 years. Quite simply I think it's the best and safest product to use on bentgrass. University testing has proved that it's the most effective and least damaging.
–Peter Wilson
Medinah Country Club,
Medinah, Illinois

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cient. "If traffic volume is high, or if the soil is heavier than most, it might be desirable to aerate more often."

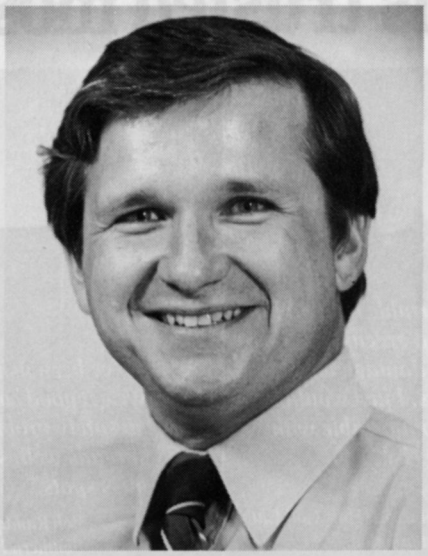
Spoon/tine controversy

Hollow core aeration is done either with spoon-like tines or straight, hollow tines. Most professionals in sports and recreational turf prefer hollow tines, citing less surface damage as the reason. Shearman says the effects of hollow tine aeration are longer lasting.

"Spooning tends to be shorter lived," he says, " because the divot can fit back into the location from which it was removed and be compacted down."

Shearman feels spoon aeration is used by those who want to spend less time and energy, as a spoon type aerator covers more ground in less time.

"We on the commercial scene prefer spoons," says Chapman. "Soil is better able to be redistributed once it's brought to the surface. The spoon removes the core, and distributes it over the turf."



Robert Carrow: His research at the University of Georgia Tends to support the belief that solid-tine coring is less effective as a turf cultivating procedure.

Is there a distinction to be made between golf course and commercial aerating? Shearman says the basic precepts of the two methods are similar.

"You're shooting for the same end result," he says. "Control of compaction and soil interface, management of thatch buildup, layering and enhanced water flow."

But Robert Carrow, Ph.D. at the University of Georgia, suggests that commercial turf might require more attention after coring.

"Golf course superintendents usually apply supplemental fertilization before or after coring in order to get rapid recovery," reminds Carrow, "so you don't see much surface deterioration. But in a lawn care situation, the routine fertilization is not sufficient to promote rapid recovery. Applying a half-pound of nitrogen right after coring will guard against excess damage in commercial situations." **LM**

CORING AERATORS

COMPANY AND PRODUCT MODEL	TINE TYPE	TINE DIMENSIONS/WIDTH IN INCHES	PENETRATION DEPTH IN INCHES	TINE SPACING IN INCHES	TYPE OF MACHINE (TOW OR WALK)	SPEED OF OPERATION	MACHINE WIDTH IN INCHES	WEIGHT IN LBS.	SUGG. RETAIL PRICE	COMMENTS
TERRACARE PRODUCTS, INC.										
Terra 320	Open-closed	½ x 3¾; ⅝ x 3¾	2¾	3½ x 4¼	Tow	3 APH	60	1450	7000.00	
Terra 200	Open-closed	½ x 3¾; ⅝ x 3¾	2¾	3½ x 4¼	Tow	1½ APH	36	1060	5000.00	
Walk-R-ide	Open-closed	¼ x 3¾; ⅝ x 3¾	2¾	3½ x 4¼	Walk or Ride	¾ APH	18	600	3000.00	
Terra 98	Open-closed	½ x 3¾; ⅝ x 3¾	2¾	3½ x 4¼	Tow	1 APH	22	500	2000.00	
TORO CO.										
Fairway aerator	Hollow	¾ x ⅞	3-5	5.3 x 6; 3½ x 3	Tow	2.2 MPH	63	2600	19,400.00	New for Spring 1989
Greens Aerator	Hollow	⅜-¾	0-3	2¼ x 2½	Walk	1.1 MPH	27	1275	9325.00	
686	Open, closed, slice	½ x 4	N/A	6 x 6	Tow	0-10 MPH	78	1420	3400.00	
687	Open, closed, slice	½ x 4	N/A	6 x 6	3 Pt Tow	0-10 MPH	78	1290	2634.00	
96	Open, closed, slice	½ x 4	N/A	6 x 6	3 Pt. Tow	0-10 MPH	42	600	1620.00	

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Circle No. 117 on Reader Inquiry Card

PEOPLE ARE OFTEN A TREE'S WORST ENEMY

More urban trees are being killed today by the activities of people than are lost due to all the diseases and insects problems combined.

by Terry A. Tattar, Ph.D, Shade Tree Laboratory, University of Massachusetts, Amherst

Trees along our streets, in our parks and near our homes improve the quality of life in our cities and towns. And though all trees are threatened with pathogens, insects and stresses from the extremes of the environment, these urban trees face a much more formidable enemy, abuse by *people*.

It is ironic that urban trees provide so much enjoyment for people who in turn are often responsible for acts that result in tree death. The activities of people that stress, injure and often kill trees are known collectively as "people-pressure diseases," or PPDs.

The urban environment however, is not the only area where PPDs are found. Greater demands on campgrounds and forest recreation areas has resulted in PPDs being found there as well.

The most common forms of PPDs are caused by construction, soil abuse, lawn and garden equipment and improper tree care.

Recognition of the most frequent examples of PPDs will enable us to become aware of the PPD problem and be more effective in its control.

Supports should not be left on the tree for more than one growing season.

Building and road construction are by far the most frequent causes of injury to trees by people. Trees are injured by earth-moving equipment and by changes in ground level.

To protect these trees, barriers must be erected to protect the root system from being disturbed by construction.

In the past, efforts to protect the trunk from injury were mistakenly thought to be adequate to preserve trees. Small wooden "cages" were erected by contractors around large shade trees. The efforts failed because trees' roots extend far beyond the edge of the branches. These trees often died from extensive root injury and soil disturbance after construction was completed. It is important to remember that the roots of a tree extend far beyond the drip line. Roots can often be found at a distance from the trunk that exceeds twice the height of the tree.

Efforts must be made to protect as much of the soil area as possible from any disturbance by construction equipment. Identify trees scheduled to be preserved on construction sites before construction begins and then protect them from root injury and ground level change until all construction is completed.

Trenching, surface grading and storage of construction fill can all result in tree death.

The loss of either large or small roots places the tree in a state of imbalance and stress. The affected tree slows its growth and often begins to "dieback" in the branches of the crown. The tree in this state is often susceptible to attack by weak pathogens and secondary insects that wouldn't have been able to attack it when it was healthy and vigorous.

Loss of large supporting roots can also make a tree a potential hazard from falling. Root-injured trees should be examined by a professional arborist and removed if hazardous.

Construction-damaged trees often decline progressively in the years after construction, leaving property owners confused as to the cause of the tree's poor health. Ground-level changes can cause cut roots if the level is lowered or smothering from fill if it is raised.

The addition of asphalt, concrete, or more than a few inches of soil will change the amount of water and oxygen available to the roots below. If gas exchange is inhibited between the air and the roots, smothering will occur. Carbon dioxide from root respiration builds up, oxygen decreases, and eventually the roots die of suffocation.

Fill-damaged trees, like root-injured trees, grow more slowly and often die back in the crown within a few years after construction is completed. Secondary pathogens and insects are also a threat as decline progresses.

Too little, too late

It is possible to regain balance in some root injured trees by crown reduction pruning in the early stages of decline. It is also possible to remove fill from

over the roots soon after it has been added to prevent suffocation. However, these efforts usually come too late, and the total amount of injury sustained during construction is often fatal to the trees.

It is recommended, therefore, that tree protection, through the use of barriers to all construction activities around trees, be the main strategy to prevent construction damage to trees.

Tree wells with an aeration system over the roots can be helpful in saving them where a raise of grade is necessary. Too often the well is simply constructed around the trunk and most of the root system is covered with suffocating fill, often several feet thick. An aeration system is the key to preserving trees where the grade is raised (see related story). A properly constructed tree well can allow sufficient air to reach the roots to permit the tree to live and grow normally after construction. Many trees in such wells have been growing for more than 40 years.

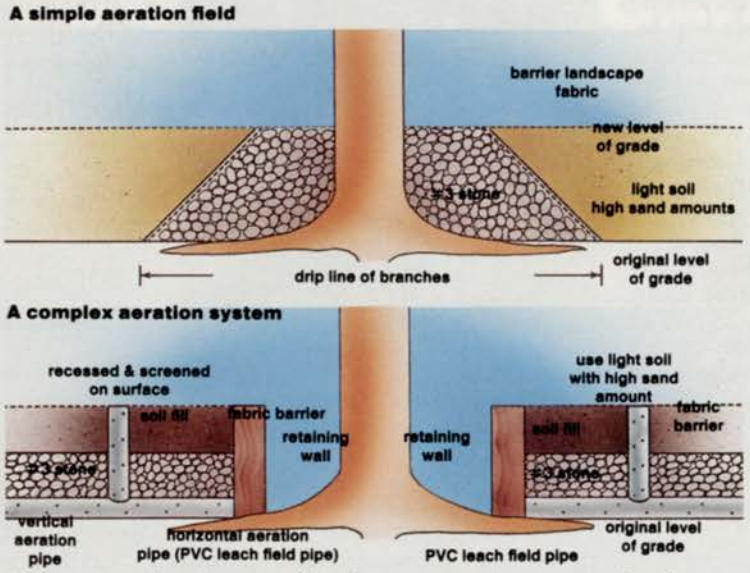
Proper soil conditions are critical to the health of all trees. Chemical and physical changes in soils as a result of peoples' activities are termed "soil abuse."

Chemical injury from deicing salts, herbicides and improper use of agricultural chemicals are common forms of soil abuse.

Deicing salts, now in use on highways and walks in many parts of the country, contain sodium and/or calcium chloride, both of which are toxic to trees.

Small trees and shrubs that are exposed to salt-laden spray from traffic should be screened with burlap or other appropriate materials. Also, channel salt in water runoff away from the roots of trees and use salt-tolerant species in areas where exposure to salt is unavoidable.

AERATION ENSURES URBAN TREE SUCCESS



Anyone who has walked through a forest has felt the soft organic layers of soil, covered with natural mulch from rotted leaves, beneath their feet. This soil, full of holes between organic matter and soil particles, is ideal for tree root growth.

Urban soil however, has often been disturbed so much from construction and other human activities that it is as hard as concrete.

Soil compaction in the urban environment is one of most important sources of soil abuse. The urban tree professional needs to understand the most common forms of soil abuse and the means to restore urban soils around trees to a "forest-like condition."

Alleviating compaction

Compacted soil contains little air and roots are often unable to penetrate it. Urban trees often become confined to small areas of soil that provide insufficient nutrients and moisture to sustain them. Low air conditions also cause root suffocation.

Trees suffering stress from soil compaction grow slowly, appear in poor vigor and often begin to decline a few years after planting. Soil compaction can be avoided by channeling heavy foot or vehicular traffic to specific paths and by adding cushioning mulches over the roots of trees.

Barriers to traffic, such as walls, curbs, benches, shrubbery and fences are effective in keeping people and vehicles away from trees and can be an attractive addition to the landscape as well.

Compacted soil needs to be aerated by making a series of holes in the soil in a grid around the trees. Aeration can be performed while applying dry fertilizer via soil drill or liquid soil injection. Aeration can also be performed by using a liquid soil injection using only water, or simply by drilling holes, if fertilization is not desired.

Aerated soil, however, will only be a temporary solution if foot and vehicular traffic are again allowed to compact the soil.

—Terry Tattar

Pesticides and fertilizers can be beneficial or injurious to trees, depending on if they are used properly or improperly. A commom misconception is "if a little is good, a lot more will be better." Proper use of these chemicals includes strictly following label recommendations.

Weed-and-feed mixtures, in which herbicides are mixed with turf fertilizers, should be avoided around trees since the herbicide may be absorbed by the tree's roots in toxic amounts.

All herbicides should be considered potentially injurious to trees.

If a spill occurs, identify the herbicide and try to pick as much of it up as possible. This may mean the removal of contaminated soil or detoxification of the soil using activated charcoal.

It is best not to water the herbicide-injured tree until as much herbicide as possible is removed. Even then, water only after the exact nature of the herbicide is known.

Some industrial strength non-specific herbicides are extremely toxic to trees and are quite persistent. Watering in these cases could spread the still-active herbicide, increasing the injury and possibly endangering nearby trees as well.

Carelessly used lawnmowers, string trimmers, snowplows, rototillers and other mechanized lawn and garden equipment are often involved when serious tree root and trunk injuries occur. Lawn and garden crews and homeowners need

to learn how to avoid injuring trees when using this equipment.

By removing sod near trunks and exposed tree roots, the need to mow or trim near trees is eliminated. Adding organic or inorganic mulches around the trunk and buttress roots will inhibit weeds, improve soil moisture retention and remove the need to drive equipment near the trunk and over exposed roots. Bright-colored guideposts along driveways will help keep snowplows and motorists on course and away from trees and shrubs.

Rototilling should not be allowed near trees because many tree roots, which grow in the top few inches of soil, will be cut.

If plantings are desired under trees, select only perennials and place them in a mulched area around the tree. Annuals that require yearly soil disturbances around the tree should be sited as far as possible away.

Improper tree care

Trees greatly benefit from proper care but can be severely damaged or killed by well-meaning but misdirected attention. Improper pruning and wound treatment, guy wire injury, petroleum jelly injury and suffocation from plastic wrap are some common examples of improper tree care.

Proper pruning helps trees by removing diseased, dying, dead and defective branches. A proper pruning cut is made by severing a branch as close as possible to the outside of the branch bark ridge.

The "wooden cage" fails because it doesn't adequately protect tree roots.

Avoid injuring or removing the branch collar during the pruning cut. Trunk and root wounds should be trimmed of loose, ripped and torn bark. Any wood splinters must also be trimmed and smoothed to facilitate wound closure. The wound should be shaped to remove minimal live bark and also to avoid creating pointed edges.

It is, therefore, not necessary to achieve an oval shaped wound. A thin coat of tree paint may be applied over the surface of a pruning cut or wound surface for cosmetic purposes. Guy wires, cords to secure wraps or anything restricting the growth of the tree will eventually strangle it if they are not removed. Many valuable shade trees are killed each year because those who planted trees neglected to return and remove guy wires when they were no longer needed.

Trunk supports should not be left on the tree for more than one growing season. Hemp cords used to secure trunk wrap or planting ball wrap do not biodegrade fast enough to avoid trunk or trunk collar strangulation. Tree wrap should be secured with string or masking tape and removed after the first growing season.

Building and road construction are the most frequent causes of injury to trees by people.

Cords around planting balls should be removed at planting and never left around a tree after it has been planted.

Inspect all newly-planted trees on a regular basis to eliminate problems. Planting wrap on a balled and burlapped tree may be left in place after planting a tree if it is made of biodegradable material, such as burlap. Recently, woven plastic or plastic sheeting has often been used for wrapping balled and burlapped trees. These materials will not break down and will prevent outward movement of plant roots, suffocating the balled tree.

Always remove the cords that tie the ball around the trunk and roll back the wrap from around the trunk. You may leave burlap wraps around the planting ball, but remove **all** plastic containing wraps from trees when planting.

Avoiding bark injury

During a recent insect epidemic, many homeowners applied petroleum jelly directly to tree trunks to trap leaf-eating caterpillars, in hopes of protecting their trees without spraying. Petroleum jelly, like many petroleum products, injures tree bark, and many trees were killed by these homeowners. In fact, most insect-defoliated trees survived while the petroleum jelly-treated trees did not.

Avoid placing any chemicals on tree bark. It is living tissue and will be killed by oil-based paint, grease and oil—as well as petroleum jelly.

PPDs are created by ignorance and lack of concern. By teaching people how they can avoid injuring trees, all PPDs can be prevented. **LM**

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Birches	Ponderosa Pine	Balsam Fir	Red Maple
Black Cherry	Poplars	Basswood	Red Pine
Black Locust	Quaking Aspen	Black Walnut	Shagbark Hickory
Bur Oak	Red Cedar	Hackberry	Speckled Alder
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Circle No. 133 on Reader Inquiry Card

LOW INPUT LANDSCAPING

Lawn grasses are one of the hardiest plant systems known. So why not let them take care of themselves?

by W.M. Mitchell, P.h.D. University of Delaware

The principles of LIL include heavily aerifying the lawn, topdressing it with ½-inch of municipal composte and vertiseeding it.

As landscapers, you've been told from every quarter that lawn grasses and flowers get hungry and must be fed on a regular basis. There are the weekly columns in which you are urged to be on the look out for the weed, bug, or microbe that's about to strangle or suck the life out of your grass or flowers. And, of course, there is a fertilizer, insecticide, herbicide or fungicide to beam at each of these pests or conditions.

Could garden experts all be wrong? Have they missed some startling breakthrough in "green thumbery"?

Probably not. It's just that so-called "proven-practices" don't stay proven. From time to time, current practices are challenged and new insights bring different solutions to old problems.

The theory of less

Lawns and flower beds worthy of bragging rights can be had with far less chemicals (fertilizers and pesticides used so extensively on home grounds) than are normally used.

Some practices that have been followed for a number of years simply are not acceptable for the long run. A kind of internal review is under way in the agriculture community, and buzzwords such as "sustainable agriculture," "integrated pest management" and "low input farming" are being thrown about.

A major thrust of this review is to maintain or improve farm profitability while reducing the use of chemical fertilizers and pesticides. It is anticipated that these programs will also help to improve the quality of surface and groundwater supplies.

Isn't it time to launch similar Low Input Landscaping (LIL) programs aimed at lawns, flowerbeds, shrubbery, and recreational areas? The principles of LIL can easily be applied to home lawns.

A primary reason that low input lawn and garden programs can be successful is tied to stress. Although it may seem an oversimplification, the key to successful lawn care is removal of stresses that normally zero in on lawn grasses.

Research and experience confirm that acid soil, soil compaction and shade are examples of common plant stresses. Though plants may survive these stresses, the introduction of an additional stress—such as a fungus, weed or an insect—may be more than the plant can handle.

Stresses become additive. In a low input plant management system, emphasis is placed on eliminating stresses by using methods that don't call for chemical treatment. For example, thatch and soil compaction can be eliminated by aerification and top dressing. If a tree's shade is responsible for a fungus, its bottom branches can be removed, it can be cut down or red fescue could be planted—instead of or before applying fungicides.

So what is LIL?

In essence, an LIL system provides an optimum environment for plants. Plants respond with vigorous growth. And, under these relatively stress-free conditions, pressures from disease organisms, insects and weeds are more easily thrown off.

Examples of stress-producing practices that should be avoided in LIL lawns include:

- Growing Kentucky bluegrass on fully exposed lawns that face south in the transition zone. Switch to tall fescue blends that have greater heat-moisture tolerance than bluegrass;
- Using excessive nitrogen, which contributes to thatch build-up, shrinks root systems, reduces plant food reserves and decreases vulnerability to some diseases;
- Using Kentucky bluegrass, low cutting heights and excessive nitrogen under shade conditions;
- Mowing Kentucky bluegrass and fescue lawns at less than 1½ inches, shortening the root system, reducing stand density, and encouraging encroachment by crabgrass and annual bluegrass. Avoid stress by raising the cutting height to two inches, or higher; and
- Allowing soil acidity to increase,

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For more great ideas, give your Ransomes distributor a look. Or call Ransomes, Inc., One Bob Cat Lane, Johnson Creek, WI 53038, (414) 699-2000.

RANSOMES

BOB-CAT®

WHERE GREAT IDEAS START

Circle No. 241 on Reader Inquiry Card

causing thatch build up and poor performance of Kentucky bluegrass.

Although lawn grasses are vulnerable to many different stresses, a lawn can be one of the most self sustaining plant systems known. Not only do lawns function as sites of vital gas exchange, but they practically eliminate soil erosion. And, with a root system that is active except in the dead of winter, they prevent significant loss of nutrients to the groundwater.

Leave the clippings

For a lawn to reach its full potential as a self-sustaining system however, grass clippings should remain on the lawn where they will decompose and release nutrients essential for sustained growth. (See this month's "Jobtalk.")

As clippings rot, they add to the vital humus content of the soil. This is recycling at its best. Unfortunately, it has become traditional to collect and remove grass clippings, place them in plastic containers, and send them off to the landfills. On any given summer day, thousands of plastic bags, stuffed with lawn clippings, show up at the landfills. This practice is not only a direct expense to the home owner in trash removal, but it is also an expense to society as it significantly reduces the life of landfills.

In the interest of prolonging landfill life, some states and municipalities now prevent the dumping of leaves in landfills. Can similar rulings aimed at lawn clippings be far away?

H_2O management

A second important step in LIL is water management. Water is a critical resource and will become more so with the demands of an expanding population. Failure to provide water for plants quickly causes a severe stress. In partitioning limited water supplies, it's clear that people will come first and plants must "make do" with what's left. Given the inevitable short supplies of water for landscape work, it's imperative that more performance be wrung out of every drop.

Drought-tolerant species and moisture conserving mulches must be used where possible. Drip and subsurface irrigation should be explored as techniques that can increase water use efficiency to more than double that of overhead sprinkler equipment.

The essentials of LIL are based on the fact that adapted plant material, well managed and given optimum conditions of soil, air and water, will by itself resist the normal stresses imposed by diseases, insects, weeds and foot traffic.

The goal of LIL is to achieve optimum growing conditions for plants while keeping to a minimum the application of pesticides and other chemicals. This goal can be reached by recycling lawn and garden wastes, using humus produced by composting municipal waste and making full use of improved mechanical equipment to improve the soil-air-water system. **LM**

Applying LIL techniques to the home lawn

Vertiseeding mixes the humus and soil, creating the optimum environment for germination.

A lawn in need of improvement may benefit from the following LIL program:

☐ Make a thorough survey of the existing site. Note the topography, the degree of shade, soil texture, level of soil compaction and the pressure of thatch and existing vegetation. Measure the soil pH to establish need for lime.

☐ Thoroughly aerify the lawn using one of the new coring machines designed to remove 5/8- to 3/4-inch diameter soil plugs to a depth of 2½ to 3 inches. Coring is the first step in improving the air supply for grass roots while at the same time getting on top of a thatch problem.

☐ Topdress the lawn with screened humus from a municipal waste processing plant. Practically all major cities and many small communities either operate or are in the process of constructing such plants. Humus (composted waste product) is being used on the Capitol grounds in Washington, on statehouse lawns and on the most prestigious golf courses and home landscapes.

Humus improves the physical condition of the soil while at the same time supplying essential plant nutrients. Humus, in addition to clippings which are allowed to remain on the lawn, will supply all of the plant nutrients needed for healthy, vigorous grass.

Broadcast humus to a depth of 1/8 to 1/2 inch (0.4 to about 1.5 cu. yds. per 1,000 sq. ft. of lawn). If the lawn is exceedingly rough, mix humus with equal parts of sand or topsoil prior to broadcasting.

☐ Vertiseed the lawn using one of the highly effective vertiseeding machines that have appeared on the market. Vertiseeding will mix humus with soil and provide seed-soil contact that is so essential for germination.

There is a wide range of grass species and cultivars to choose from. Base your selection on the environment in which the grass must grow.

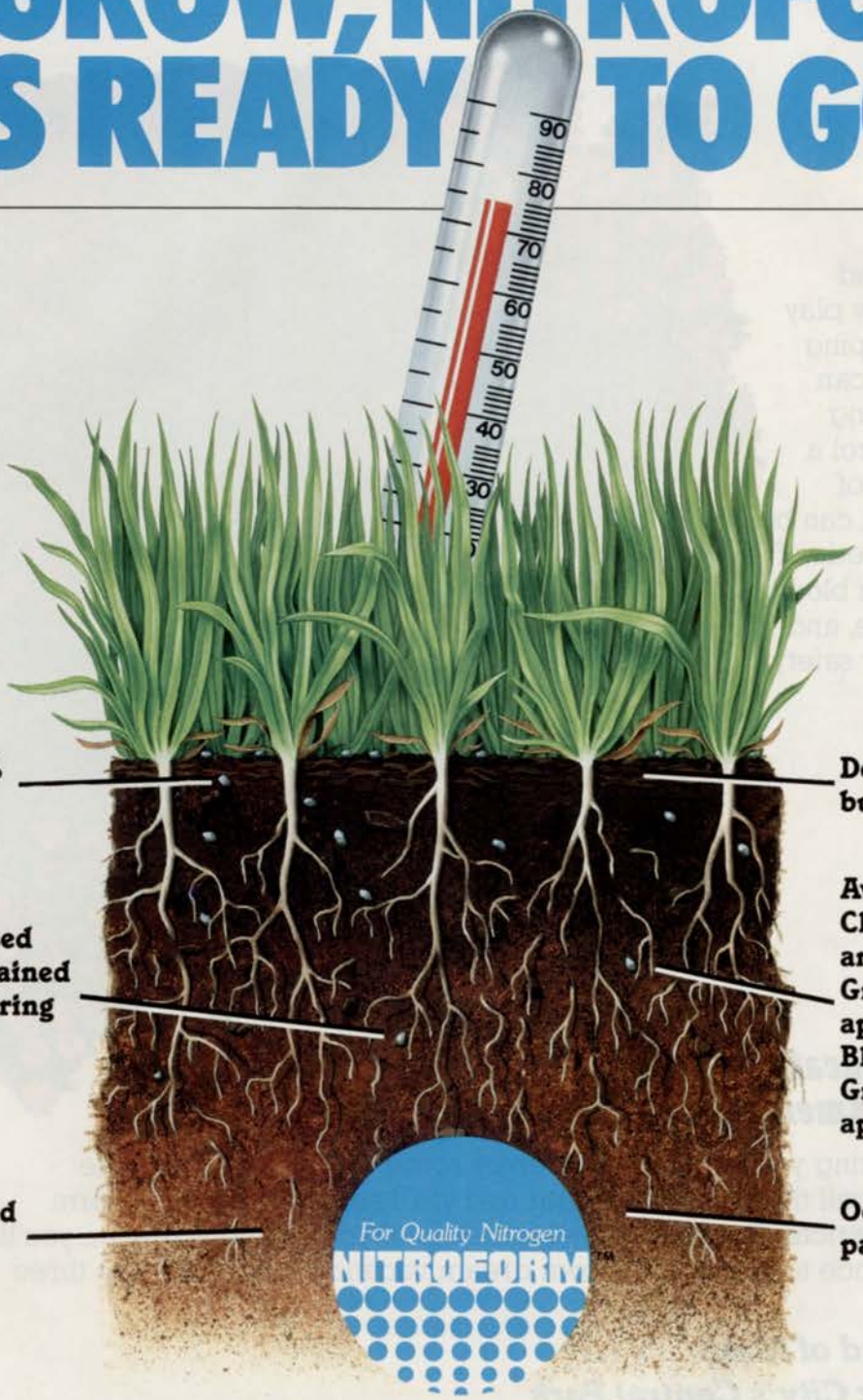
☐ Maintain the lawn with annual spring or fall applications of humus applied at about 1/2 cu. yd. per 1,000 sq. ft.

☐ Set the mower to cut not less than a height of 2 inches and mow on a regular schedule, trying never to remove more than 1/3 of the existing top growth. A modification of the steps outlined for lawn renovation and maintenance can be used for the care of annual and perennial flower beds, foundation plantings, trees and shrubs.

Drip irrigation tubing, mulched with composted waste, is an effective way to irrigate annual and perennial flower beds. It also shows a commitment to resource conservation as well as to waste recycling, both of which are essential components of LIL.

—*W.M. Mitchell* ☐

WHEN TURF IS READY TO GROW, NITROFORM® IS READY TO GO



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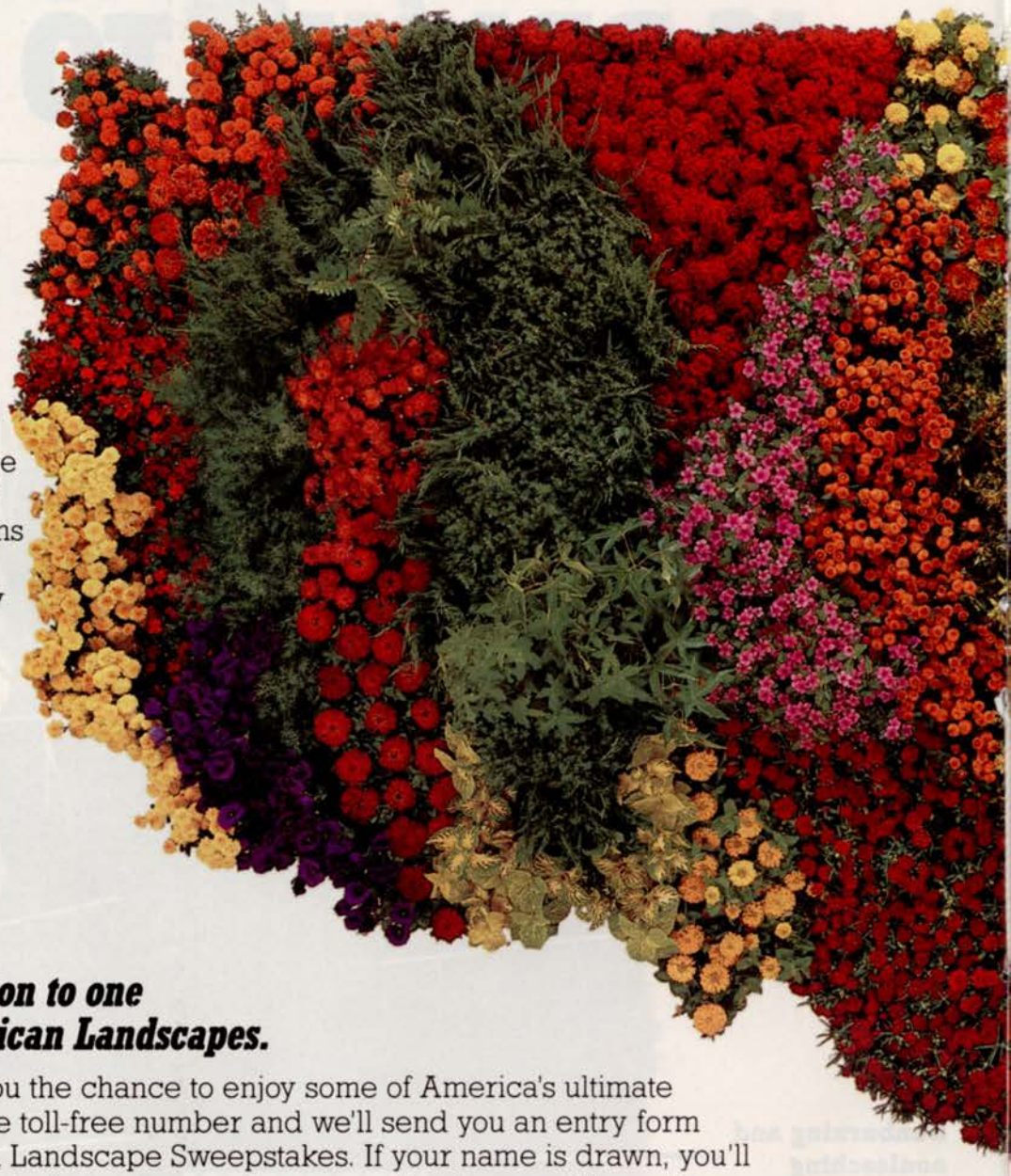
Circle No. 143 on Reader Inquiry Card

The Great American



Mavrik® and **Pentac**® Aquaflow play a big role in keeping the Great American Landscape looking great. They control a broad-spectrum of insects and mites, can be applied to hundreds of plants—even open blooms—without damage, and offer outstanding safety to applicators.

Win a dream vacation to one of three Great American Landscapes.

We're offering you the chance to enjoy some of America's ultimate landscapes. Just call the toll-free number and we'll send you an entry form for the Great American Landscape Sweepstakes. If your name is drawn, you'll be given the chance to design your own dream vacation to one of these three garden spots:

The Island of Maui
New York City's Central Park
San Francisco's Golden Gate Park

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You can also enter the Great American Landscape Sweepstakes by visiting the Sandoz booth at one of the upcoming trade shows listed below. All Sweepstakes entries received at the show will be entered in a "Show Special" drawing. On the last day of the show, you could win a Weber Genesis III deluxe gas grill.

TO ENTER THE GREAT AMERICAN LANDSCAPE SWEEPSTAKES:

Visit the Sandoz booth at:

Tropical Plant Industry Expo
January 26-28, 1989
Miami, Florida

Golf Course Superintendents Association of America
February 11-13, 1989
Anaheim, California

Or call toll-free ***1-800-992-2828*** for an entry form.

In Illinois call collect ***(312) 351-5307.***

THE GREAT AMERICAN LANDSCAPE
SWEEPSTAKES

Circle No. 158 on Reader Inquiry Card

PART II of II

MANAGEMENT CALENDAR: WARM-SEASON ATHLETIC FIELDS

Quality turf can make athletic fields safer for young athletes. Field managers should follow this general guide for safer turf.

by J. R. Hall III, Ph.D., Virginia Tech

Athletic field managers should periodically evaluate their field management programs and set up programs for the entire year. This allows the professional to plan ahead for equipment and material purchasing, and to determine seasonal labor needs.

What follows, provided for planning purposes, is a generalized management scheme for Bermudagrass athletic fields. Specific dates, intensity and frequency of practices will vary with every geographic location. This calendar is only intended as a general guide for programming.

January-April

If the field is infested with winter annual weeds, is completely dormant and is not covered with straw, then weeds can be controlled by spraying with a non-selective herbicide such as glyphosate. Follow label directions closely.

Collect soil test samples from the field, sampling from several areas to a depth of three inches. Submit the samples to a reputable laboratory for analysis.

Keep traffic off field if at all possible to minimize damage to field.

If field has been protected with a straw mulch, remove the mulch about one week prior to the 50 percent frost-free date in your area. If the field was covered with a plastic tarp all winter, the tarp will periodically need to be removed for mowing and replaced to prevent frost damage. Plastic tarps should not be permanently removed until the probability of frost is zero.

Keep traffic off the field if at all possible to minimize damage to the field.

Fill in low areas with good topsoil to improve surface drainage. If areas are extremely low, cut sod out, fill area and re-install sod.

If you desire to control summer annual weeds with pre-emergence herbicides, apply a pre-emergent for summer annual weeds such as crabgrass, goosegrass or foxtail at the appropriate time in your area.

Determine amounts of winterkill and decide whether sodding, sprigging or plugging will be adequate for repair. Small plugs can be brought inside and kept in sunlight to give an early indication of the amount of winter damage the field has suffered. If damage has been minimal, plugging will suffice. Begin repair as soon as Bermuda has fully greened.

Hybrid Bermudas will need to be repaired with sprigs. Seven to 10 bushels per 1000 sq. ft. will suffice. Common Bermudagrass fields can be seeded at 1 to 2 lbs. per 1000 sq. ft.

Fields that have been previously treated with pre-emergence herbicides cannot be repaired with Bermudagrass seed unless the area to be seeded is treated with activated charcoal (5 to 7 lbs. per 1000 sq. ft.). Areas to be sprigged also can be negatively affected by recently-applied pre-emergence herbicides. Minimize this possibility by applying activated charcoal and tilling soil prior to sprig planting.

Initial fertilization should begin about two weeks after Bermuda has greened up, applying 40 to 60 lbs. ni-

Mention of specific products in this sample program does not imply exclusive endorsement of any one product. It was done only to simplify the program for educational purposes.

MUSTANG

THE TALL FESCUE THAT LOOKS LIKE BLUEGRASS

KENTUCKY BLUEGRASS

MUSTANG TURF-TYPE TALL FESCUE

BLUEGRASS QUALITIES WITH TALL FESCUE PRACTICALITY

You'll quickly notice Mustang's finer texture, rich dark green color and dense, uniform turf—and you'll understand why we say Mustang has bluegrass-like qualities.

But there's more to Mustang turf-type tall fescue than beauty; it's tough and durable. It's heat and drought tolerance, winter hardiness, and ability to endure low mowing heights are remarkable. Mustang even shows improved resistance to *Helminthosporium* netblotch and many other diseases.

Best of all, Mustang is practical, because it performs extremely well under low maintenance conditions like minimum fertilization, watering and mowing. National tests and actual applications in parks, golf courses and playing fields have proven it.

DROUGHT TOLERANCE AFTER SEVEN WEEKS NO RAINFALL.

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That's why Mustang is becoming the favorite choice of professional turf managers, over K-31 and many other commercially available varieties.

For bluegrass qualities and tall fescue practicality, use the professional's choice—Mustang turf-type tall fescue.

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trogen per acre.

May-August

Begin mowing with a reel mower as soon as the Bermuda gets 1/3 higher than the intended mowing height. Set mower slightly lower than the normal mowing height the first time you mow the field to remove debris. Maintain the Bermudagrass at mowing heights between ½ and 1 inch, depending on use being made of the field, smoothness, budget, etc. Collect clippings only if they are excessive.

Core aerify field every 30 to 45 days with open spoon ¾-inch diameter tine aerifier once field is well rooted. Make two passes over field each time. Drag field to break and incorporate aerifier cores.

Re-plug damaged areas that are not healing rapidly enough.

After field greens up, and at least 30 days after the first application noted above, apply 40 to 60 lbs. nitrogen per acre to the field on 30 to 45 day intervals. Sandy fields prone to leaching will require higher levels of nitrogen. Apply lime, phosphorus and potassium as indicated necessary by the soil test.

Fields under high levels of maintenance will benefit from periodic vertical mowing or slicing to increase tiller density.

Irrigate as necessary, watering infrequently, but heavily when you do.

If goosegrass and crabgrass begin to invade the turf, use post-emergence herbicides such as disodium methane arsonate (DSMA), monosodium methane arsonate (MSMA), asulam or metribuzin. Follow label directions closely.

If broadleaf weeds invade turf, spray with broadleaf herbicides such as 2,4-D, dichlorprop, dicamba, mecoprop, triclopyr and other labeled materials.

On high maintenance fields periodic top dressing with a suitable ma-

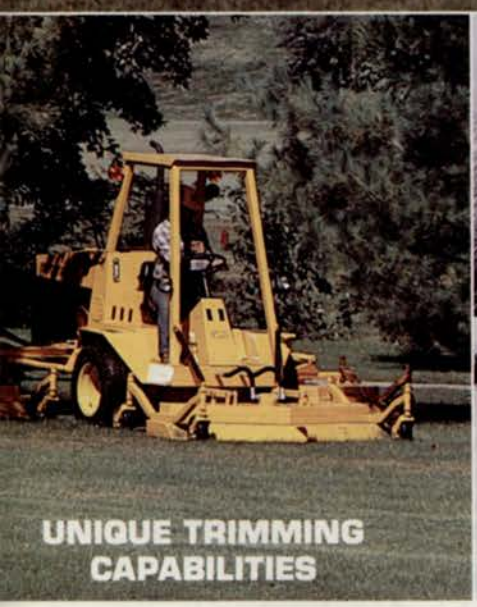
continued on page 62

WARM-SEASON ATHLETIC FIELD MANAGEMENT

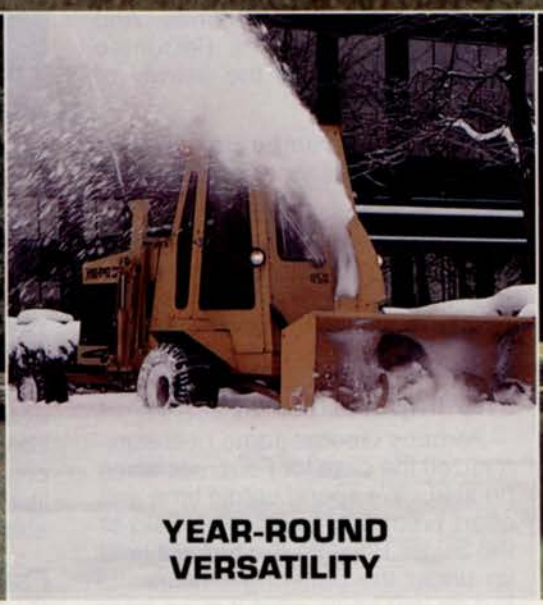
	JANUARY FEBRUARY MARCH APRIL	MAY JUNE JULY AUGUST	SEPTEMBER OCTOBER NOVEMBER	DECEMBER
AERATE		Core aerify every 30 to 45 days with open spoon ¾-inch diameter tine aerifier. Make two passes each time. Drag field to break up cores.	Core aerate 30 days before overseeding.	
FERTILIZE	Begin fertilizing about two weeks after Bermuda has greened up. Apply 40-60 lbs N/acre.	At least 30 days after first application, apply 40 to 60 lbs. N/acre on 30 to 45 day intervals. Apply other elements as indicated by soil test.	When Bermudagrass growth begins to slow, apply the equivalent of 60 lb./acre of potassium oxide to improve winter hardiness.	
IRRIGATE		Irrigate as necessary watering infrequently, but heavily.		
MOW		Mow with reel mower when Bermuda gets 1/3 higher than intended mowing height. Vertical mowing or slicing should be done periodically.	As growth rate slows, raise mowing height to 1½ inches.	
REPAIR/RENOVATE	Fill in low areas with topsoil to improve surface drainage.	Re-plug areas which are not healing rapidly. Periodically topdress, followed by dragging.		Cover field for the winter. Keep traffic off the field.
SEED/SOD	Determine the amount of winter kill and decide whether to sod, sprig or plug. Begin as soon as Bermuda has greened.		Overseeding may be desirable. Core aerate or vertical mow 30 days prior to overseeding. Top dress.	
SOIL	Collect soil samples and send them to a lab for analysis.			
WEED CONTROL	If field is dormant and not covered by straw, use a non-selective herbicide for annual winter weeds. Apply pre-emergence weed control at proper time for your area.	If goosegrass and crabgrass invade turf, use post-emergence herbicide. If broadleaf weeds invade turf, use a broadleaf herbicide.		

CUT YOUR TURF PROBLEMS DOWN TO SIZE

with HYDRO-POWER 180



UNIQUE TRIMMING CAPABILITIES



YEAR-ROUND VERSATILITY

EASY-FOLDING CUTTING UNITS FOR TRANSPORT

Your search for a high capacity mower encompassing a one man operation is now concluded. The Hydro-Power 180 with its 15 foot hydraulically driven rotary mower has a mowing capacity of up to 11 acres an hour while incorporating rear wheel steering for maximum maneuverability. Cutting units are designed for maximum floatation and may be used individually or in any combination of the three.

A foot pedal controlled hydrostatic transmission affords variable mowing speeds as well as transport speed to insure maximum travel time between the job sites. The Hydro-Power 180 offers year-round versatility with a 2-stage, 73'' snow blower and heated cab.

Manufactured by HOWARD PRICE TURF EQUIPMENT 18155 Edison Avenue Chesterfield, Mo. 63017

Circle No. 127 on Reader Inquiry Card

New amine-compatible iron greens up turf in less than 48 hours.

Prosperity resolution for 1989: Use FëRROMEC® AC (amine-compatible) in your lawn-care program. Green up your world and green up your wallet ... get a Roll-X™ Measuring Wheel in the bargain.

Everett Mealman, President
PBI/Gordon Corporation

Ferromec liquid sprayable iron can produce a deep, vibrant, emerald-green color in ornamental turfgrass very, very rapidly . . . and very, very economically. In most instances, it can achieve this miracle in less than 48 hours, at a cost of about $1.70 for a 6,000 sq. ft. lawn.

. . . But, wait! That's only part of the good news about Ferromec. Equally important is the fact that Ferromec does not produce a lot of rapid top growth that requires hours of expensive, unwanted time on the business end of a mowing machine, plus exposure to disease that so often results from abnormal growth caused by using excessive amounts of expensive nitrogen out of season to generate the green color of the grass.

And there's still more good news!

Nitrogen will eventually produce a green color, but excess nitrogen plus turfgrass equals hay. Obviously, Ferromec is a better way!

Ferromec AC can be tank mixed with any TRIMEC® Herbicide formulation, so it gets a free ride. And guess what else. The Ferromec actually speeds up the activity of the Trimec!

Indeed Ferromec is unique. There's absolutely nothing like it on the market.

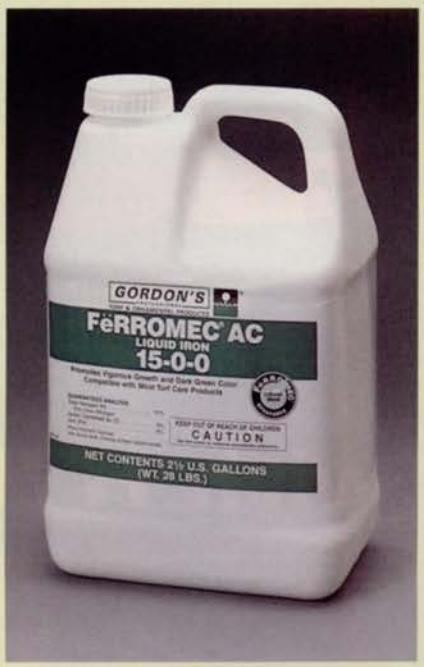
No wonder literally thousands of lawn-care operators, landscape managers and golf-course superintendents are now using Ferromec in their turf-care programs.

The importance of color

Perhaps George Toma best summarized the case for Ferromec when he said, "We spend untold time and effort preparing the playing field of the Super Bowl so the turf will hold up under the battering it takes . . . But do you know what it is we hear about? We hear about that beautiful green color we get from Ferromec!"

Color is so important! You give a homeowner a brilliant green lawn, and give it to him fast, and you've got a happy customer who will recommend you to his friends.

Surely you'll want to try some Ferromec in 1989. To help you make that decision, we're offering you a chance to order a $60 value



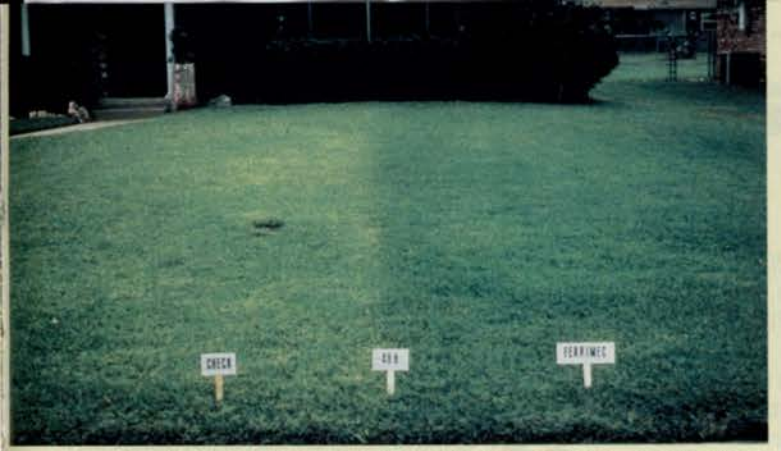
Roll-X™ Measuring Wheel for only $20 when you buy five gallons of Ferromec AC. (You'll need an extra wheel to measure all the new lawns you'll be invited to bid on when your customers tell their friends about your work.)

Meantime, you might like to review some of the facts about iron, which will help you understand how Ferromec works, and why no other company can offer you a product like our patented Ferromec sprayable iron.

Facts about iron that turf professionals need to remember.

First: Iron is essential for the synthesis of chlorophyl. No iron . . . no green.

Second: In most instances where ornamental turf is being grown there is not enough naturally occurring iron in a useable ferrous state to produce a vibrant green color. Accordingly, a chelated iron can be added to the soil.



St. Augustine grass lawn in Texas showing the darker color (right) produced by Ferromec Liquid Iron applied in early September at 8 oz./1,000 sq. ft. The green-up became visible within 2 hours and the darker color persisted until dormancy, a couple of months later, according to Wallace Menn of Bryan, Texas, a turfgrass specialist who conducted the test.

Half of this green at Hodge Park Golf Course in Kansas City was sprayed with Ferromec and, within 24 hours, the color change was dramatic. Under normal growing conditions, visual response usually occurs between 8 and 48 hours after application. Ferromec is also effective on trees, shrubs and herbaceous plantings.

Third: Chelated iron is primarily absorbed through the roots rather than by foliar activity. To get enough chelated iron into the grass through the roots to produce the desired color rapidly, it is necessary to speed up the growth by using nitrogen. This will eventually cause the grass to green up. But it will also bring on excessive growth that will cause unwanted mowing and exposure to disease.

FëRROMEC is different

Ferromec, on the other hand, is unique; and it works in a totally different way.

Ferromec is a patented process that involves bonding a ferrous iron molecule to a urea molecule. When sprayed on turf, Ferromec is ingested almost immediately via foliar intake at the point where chlorophyl is formed. Once inside the plant, the iron-urea molecular bond breaks apart because the plant has such a ravenous appetite for nitrogen.

The result is that the iron molecule in Ferromec goes to work almost immediately to create chlorophyl and, depending on the condition of the turf and the weather, green-up occurs any time within 8 to 48 hours . . . *without causing excessive growth.*

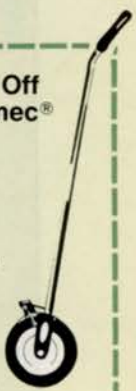
Special formulations for special problems

Iron is a micronutrient essential for all plants, but the amount required can vary dramatically, depending on the kind of fertilizer used and the composition of the soil. Sometimes zinc and/or manganese are also required, so we have developed special formulations to cover such specific needs. For information relevant to your own situation, call us.

Call Toll-free 1-800-821-7925
In Missouri, 1-800-892-7281
Ask for Sales Service Department.

1988 Super Bowl playing field at the Jack Murphy Stadium in San Diego received three applications of FERROMEC Liquid Iron along with Gordon's BOV-A-MURA® Organic Activator. Internationally known NFL turf consultant George Toma (right), pictured with son Chip, says the playing surface was sparsely covered with dormant Bermuda, including many areas of bare ground, and was seeded with turf-type ryegrass only 25 days prior to the game. "We couldn't have made it," says Toma, "without the root-building strength of BOV-A-MURA and the color enhancement of FERROMEC."

Measuring Wheel 2/3 Off When You Buy Ferromec®



To receive via UPS your $60 value Roll-X™ Measuring Wheel with collapsible handle for only $20, send this coupon to PBI/Gordon Corporation with proof of purchase (a copy of invoice or sales ticket) showing you have purchased five gallons or more of Ferromec AC Liquid Iron between November 1, 1988 and October 31, 1989, when offer ends. Limit one per customer.

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FERROMEC is available from Green Cross in Canada, Toyo Green in Japan and Farmura Ltd. in the United Kingdom. For other sources abroad, inquire of Gordon International by FAX: 816-474-0462.

++FëRROMEC® AC

AMINE-COMPATIBLE LIQUID IRON

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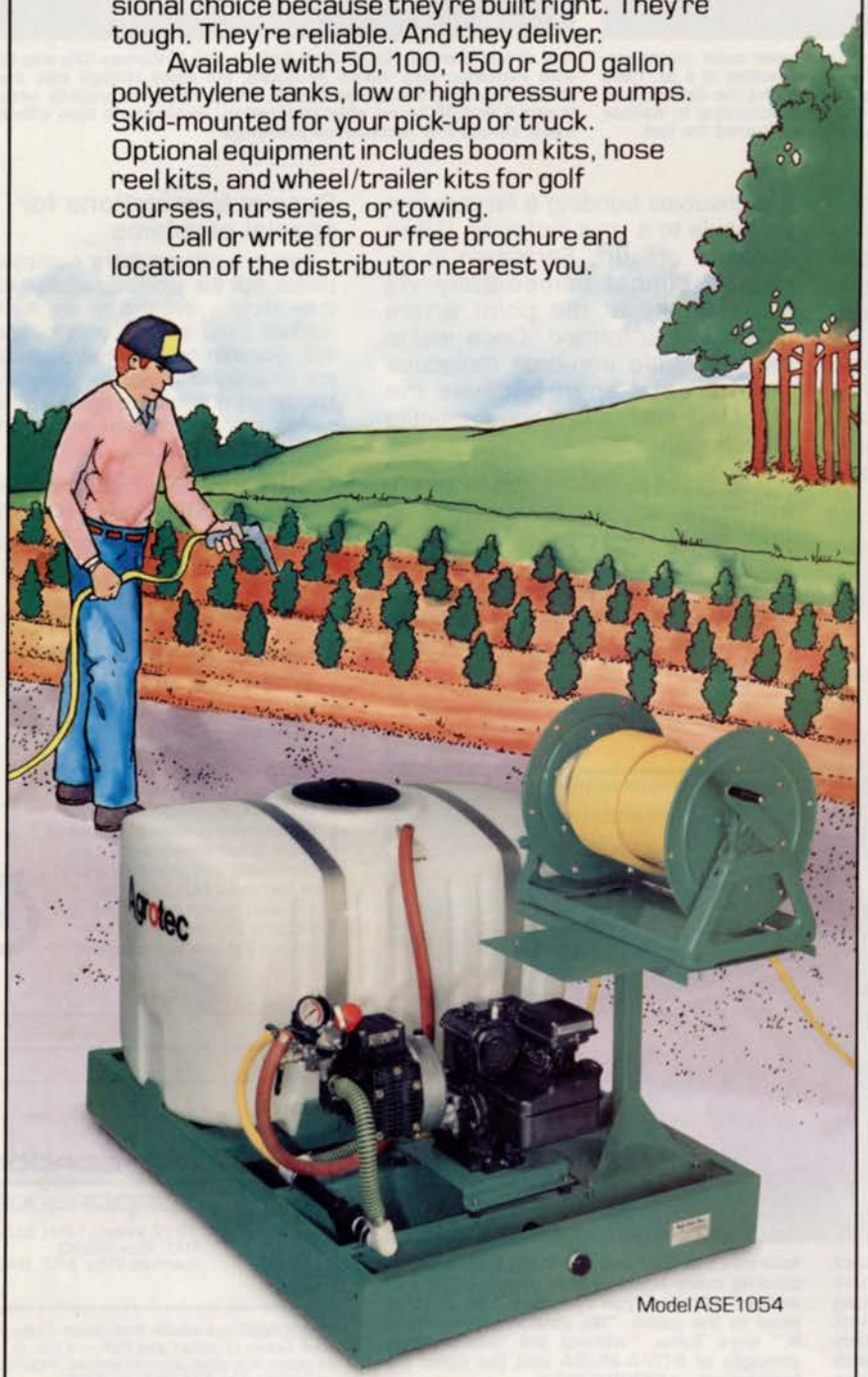
Agrotec PRO-CARE Sprayers are the Professional choice because they're built right. They're tough. They're reliable. And they deliver.

Available with 50, 100, 150 or 200 gallon polyethylene tanks, low or high pressure pumps. Skid-mounted for your pick-up or truck. Optional equipment includes boom kits, hose reel kits, and wheel/trailer kits for golf courses, nurseries, or towing.

Call or write for our free brochure and location of the distributor nearest you.



Model ASE1054

Agrotec®

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Circle No. 101 on Reader Inquiry Card

ATHLETIC *from page 58*

terial, followed by dragging, will smooth the surface and improve the field's playability.

September-November

Fall overseeding of some fields with perennial ryegrass may be desirable. Core aerification and/or vertical mowing 30 days prior to overseeding may be beneficial. Top dressing after overseeding encourages seed-soil contact. Late-season vertical mowing of Bermudagrass that is not inherently winterhardy, will likely reduce its chances of winter survival and should not be done in conjunction with overseeding.

When Bermudagrass growth begins to slow at the end of summer, apply the equivalent of 60 lbs./acre of potassium oxide (K_2O) from either potassium chloride (0-0-60) or potassium sulfate (0-0-54) to improve winter hardiness. In areas where winter hardiness is a concern, stop or severely reduce nitrogen applications.

As the Bermudagrass growth rate slows, raise the mowing height to 1½ inches to improve insulative effect and reduce probability of winterkill.

Plastic tarps can be used during the season to protect the field from excessive rainfall and minimize traffic damage resulting from the excessive moisture.

December

In areas where winter survival is a serious concern, after the last game, cover field with 4 to 6 inches of clean straw or a clear plastic, vented polyethylene 4-mil tarp or similar cover to maximize winter protection and reduce chances of winterkill. If straw is used, you will need 250 to 400 bales of straw. Straw can be secured with netting, or string and stakes to keep it from blowing.

Keep traffic off of field during winter if possible. **LM**

USEFUL EQUIVALENTS

Football field area: 360' x 160' = 57,600 sq. ft. = 1.3 acres

Area between hash marks: 300' x 54' = 16,200 sq. ft. = 0.37 acres

Area in 440 yard oval: 100,188 sq. ft. = 2.3 acres

1 gallon = 3.785 liters = 128 fluid ounces = 4 quarts

1 ounce = 29.57 milliliters

1 quart = 946.3 milliliters

1 fluid ounce = 2 tablespoons = 6 teaspoons

Circle No. 154 on Reader Inquiry Card→

A SWINGING SAFARI

Superintendents at the Mount Kenya Safari Club in East Africa lack most of the equipment and expertise of even the most backward landscape manager in the U.S. Yet they maintain a beautiful club that attracts an international clientele.

by Ann Reilly

"Paradise" is the best way to describe the Mount Kenya Safari Club, the famous resort and hotel located half-a-day's drive north of Nairobi, Kenya. Built in 1959 by actor William Holden and two non-Hollywood friends, the magnificent hotel and landscaped grounds are set into the side of the country's tallest mountain at an altitude of 7,000 feet.

The club's location halfway up the mountain is perfect. It's not so high that it lies within the cloud cover that often envelopes the mountaintop, yet it's high enough that its position on the equator does not translate into too much heat.

For about five years (shortly after Holden's death) and until one year ago the grounds had been in a steady rate of decline. Only recently has it been completely renovated.

What has happened at the Mount Kenya Safari Club is almost miraculous, based on the short amount of time it has taken. Most labor-intensive was weeding and replanting. (All plants are brought in from Nairobi nurseries, although in the future the club staff plans to propagate most of its material itself.)

Superintendents Zachariah Mehru (r) and Joseph Lucas are the primary source of education for Mt. Kenya Safari Club's 60-person landscape management staff.

Emphasis on color

There is a great deal of emphasis on tropical and exotic plants: monstera, ficus, fuchsia, schleffera, bouganvillea, giant honeysuckle and succulents are among the many. The importance of color in making a dramatic landscape is realized here and at other sites in East Africa, and obtained to a large degree from flowering annuals. Salvia is one of the best producers in this climate, along with petunias, ivy geraniums, geraniums, begonias and gazania.

Perennials grown across most of the U.S. are abundant, behaving somewhat differently due to the differences in climate. For example, daylilies are practically everblooming all year long. Other plants are closer to the material grown in the southern parts of our country. Agapanthus, tiger flower and calla lilly are truly perennial and never seem to be out of bloom. Because the club is on the equator, there is no summer/winter effect.

Soil is difficult to work with. It is a red loam soil that can change from dust to mud in a matter of minutes.

Because of the problem with the soil, all of it at the Club is improved with cow manure, which is readily available. The manure is worked into the soil deeply to improve drainage prior to any planting. Agricultural lime is also used to raise the pH and double super-phosphate or bone meal is incorporated into the soil before planting.

The Club is maintained by two superintendents: Zachariah Mehru is primarily in charge of the ornamental plantings and Joseph Lucas the turf, but each shares the responsibilities. Because no educational opportunities are available in East Africa in the areas of ornamental horticulture or turfgrass management, superintendents are not easy to find. Lucas attended a school in South Africa where he learned plant identification and some basic golf course care; Mehru had attended forestry school in Kenya and got his experience working for the horticulture unit of the City Council of Nairobi.

Many hands needed

Working for Mehru and Lucas are 60 crewmen, 30 full-time and 30 part-time. This might seem like a large staff for a 100-acre facility, but keep in mind that it is intensely landscaped and that very little power equipment is available. The crew's only educa-

Ann Reilly owns Horticultural Communications Ltd. and is a noted freelance garden writer. Her current project involves editing a new edition of the Time/Life Books garden series.

← Circle No. 154 on Reader Inquiry Card

At an altitude of 7,000 feet, Mt. Kenya Safari Club stays cool in times of dire heat yet lies just beneath cloud cover.

tion in horticultural and landscaping practices is what they are taught by the superintendents.

Diseases are rare on ornamental plants and turf in this part of East Africa, and no type of prevention or control is ever needed. Insects are around a bit—they haven't ever seen a beetle or a grub on the property, but they have their fair share of white ants.

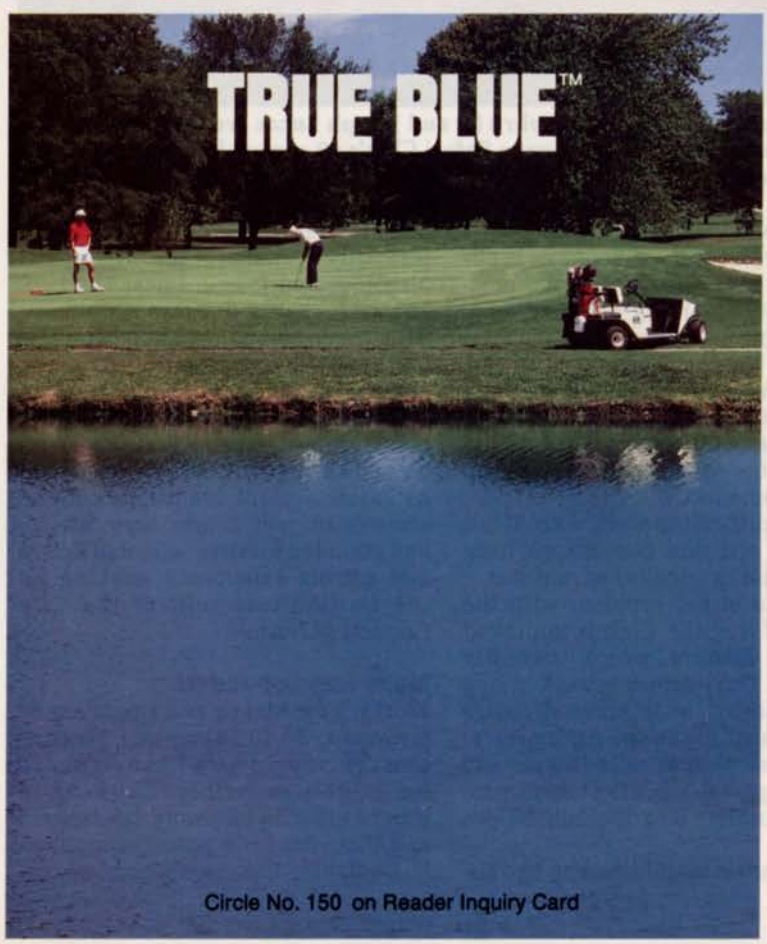
Insect control causes no problem. Malathion, diazinon and dithane are the most common insecticides, sprayed every 14 days when a problem exists. There are no licensing requirements; Kenya is an agricultural country and insecticides are easy to obtain.

Herbicides are not easy to find, though. Weeding is all done by hand, achievable in the flower beds but near impossible in turf.

The biggest problem with pests at the club is the wild animals. Superintendents in deer-ridden areas will understand the frustration of finding chewed plants and soggy footprints in the morning after the wild game has visited the night before. Ambush insecticide is used as an animal and bird repellent, but is giving far from complete control. The club is not fenced in, so the animals are free to roam. They won't usually go too near the buildings and bother the flower beds, but they will do a lot of damage on the golf course.

Fairways and tees are fertilized every six months with a mixture of super phosphate and calcium ammonium nitrate. Again, fertilizers are easy to come by because of the agri-

continued on page 76



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Who is better off—Americans or Africans?

What is amazing to me at the Mount Kenya Safari Club—and in the rest of East Africa as well—is the ingenuity taken to accomplish the same job we're used to doing with some sort of powerized equipment.

I watched a woman removing footprints from the lawn by watering them by hand and brushing them out with a broom made from a few tree branches. That same broom was used later in the day as a rake to collect grass clippings.

When new planting beds are added, the ground is broken up by hand by a man or woman using a jembe, a homemade tool that looks something like an ax. That same tool, not a shovel, is used for digging holes.

Flowers aren't planted with trowels. When new beds are ready for plants, the soil is divided with a machete-like, "Crocodile Dundee"-sized knife, the plant dropped in, the knife pulled out and the soil tapped into place.

The day before I left for Africa, I received a letter from superintendent John Lucas asking me if I could bring him a book on golf course management, which he can't buy in Kenya. Not having time to do that, I took him and Zechariah Mehru a box of old magazines which were the first of its kind they had ever seen. Nothing exists that is even close to our turf associations or golf course superintendents groups.

Are we better off? In many ways, yes; in others, I'm not so sure. Throughout East African clubs, hotels, lodges and restaurants are landscapes that will rival the most impressive in our country. Yet they are accomplished with little equipment and little more resources than manual labor and imagination.

I think we have a lot to learn from the East Africans, if only to bring ourselves back to earth once in a while to realize how fortunate we are in so many ways. Yet, since they can produce the same results, and seem to be much happier in their simpler life, who is really the better off?

—*Ann Reilly* □

African ingenuity: a broom made of tree branches is used to remove footprints from the clubhouse lawn.

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SAFARI *from page 72*

cultural economy. Urea is used on the greens, mixed with a top dressing of soil and compost before it is applied. Flower beds, when properly prepared, will last for two to three years before they need another fertilizing.

Cut flowers abound throughout the club—in the rooms, hallways, restaurants, even on the bulletin board. Although the former cutting garden was allowed to deteriorate, leading to the purchase of all cut flowers today, the cutting garden has been replanted and should be producing its own roses, chrysanthemums and alstroemeria within six months. When these plants reach maturity, it will eliminate the twice-weekly delivery of flowers from greenhouses outside Nairobi.

Greenhouse effect

Mehru hopes to have a greenhouse soon to replace the one that no longer has a roof. Cut flowers can be grown outdoors, but a greenhouse is necessary for starting annual seeds and protecting some plants from the sun and insect problems.

Container plantings are usually mulched with sheets of moss. When that is not available, a combination of shredded paper and wood chips is used. I watched several women filling planters to decorate a spot outside of the restaurant. The plants they were using were grown in paper or plastic sheeting and placed as-is into the container, with this paper/bark mulch put in between the roots to keep them more moist.

Watering is done manually. When necessary, sprinklers are turned on and off by hand. Unlike other sections of East Africa, this area has no water shortage problem as the runoff from the snow-capped mountain offers a constant supply.

Turf in the lawns and on the golf course is kikuyugrass, a tough and coarse grass that is considered by many suprintendents in California, where it grows in the U.S., to be a weed.

Lucas is in the process of removing the kikuyugrass on the greens and replacing it with bentgrass. It is difficult to kill, however, so he'll probably dig it out. The bentgrass will be planted with plugs, as grass seed is not available in East Africa. At the same time, new bunkers will be added, but not cart paths. Carts are still not allowed; everybody walks.

The do-everything grass

Kikuyugrass is used on tees, greens and fairways. It's mowed to different heights and is perfectly adaptable to these varying growth conditions. Greens are cut to 1/16 to 1/8 of an inch and fairways to about one inch with a Toro three-gang mower or Bunton greensmower. Grass is usually cut about twice a week.

The amazing thing about kikuyugrass is its perseverance. When Lucas wanted to raise and level the tees, he simply added a four-inch layer of soil and compost on top of the current tee. In a matter of weeks, the grass was growing through the new soil layer.

Mt. Kenya Safari Club, then, is a truly beautiful attraction. Thus, the club is surrounded by large private homes. One belongs to Stephanie Powers, a good friend of the late actor Holden, who also runs an animal orphanage nearby.

For six weeks every year (not when the weather is best), the club closes to the safariers and is reserved for its members only. Mt. Kenya Club offers golf, bocce, lawn bowling, horseback riding, fishing, tennis, mountain climbing and a pool. **LM**

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Circle No. 153 on Reader Inquiry Card

IRRIGATION IDIOMS

Taking on maintenance of an existing irrigation system often provides unwanted and unexpected headaches. Here's how to avoid the Tylenol.

by Jerry Roche, editor

Your landscape company has just agreed to perform regular maintenance on Wonder Company's five-acre irrigated landscape. It's going to be a nice money-maker, you're thinking.

But on your crew's first trip to the site, one of your mowers runs over a protruding sprinkler head. Instant chaos. Not too long thereafter, another head springs a leak. A bad leak. Later that same summer, in mid-July, the lawn develops a large round brown spot: another head has malfunctioned and the grass burns out.

What promised to be a profitable account has turned into a nightmare.

What could you have done to avoid some of the aforementioned problems?

Michael Essenwein of RainBird has some answers, as he told members of the Associated Landscape Contractors of America at the recent Green Team conference and trade show.

"Rather than have to use a band-aid approach, you should outline a preventive program first," said Essenwein.

The first step is to locate a site plan through the company under contract. Even if you need to go all the way back to the original landscape architect, do it.

Next, you need to locate the point of connection, where the irrigation system ties into a water source. That will be one of two spots: a pump or well or a potable water system. "You should be concerned with the potential for problems and correct errors in the existing system," Essenwein said.

Check that the connection to a potable water system has the proper (and working) backflow system, or you could be in for big troubles. "Install the proper valves here, if necessary, to isolate the irrigation system," Essenwein adds.

At this time, also check the irrigation pipe exposed to the air that leads into the ground. Galvanized pipe is always better than PVC.

Essenwein: "More people are using moisture sensors to eliminate a water cycle after a recent rainfall or when the soil is already moist."

If the point of connection is exposed it should either be boxed or, more preferably, placed under the cover of landscape plants. This will avoid accidental mower damage.

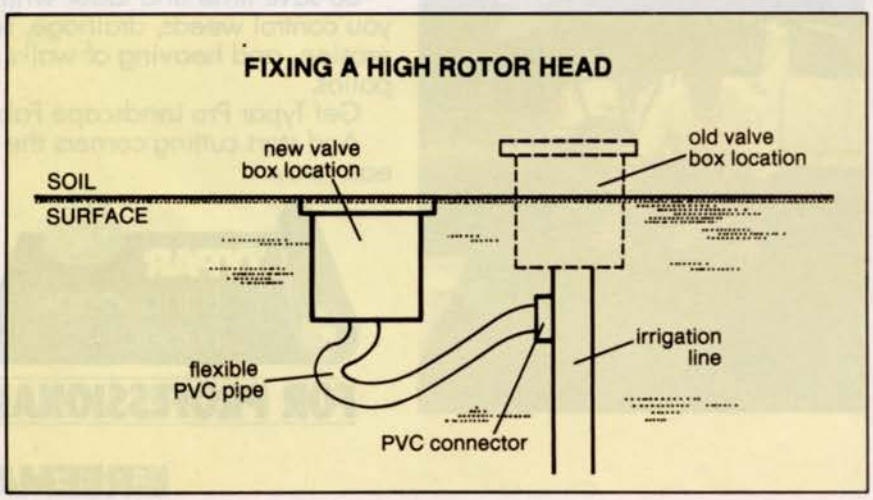
Next, go to the controller. This will be either a solid-state unit with a keypad and LED dispay, or a mechanical unit with switches and dials. The newer solid-state models are more versatile in their programming capabilities and lend themselves more easily to drip irrigation. The older mechanical models are usually easier to program.

"Find the instruction manual," Essenwein suggested, "even if you have to go to a local distributor. Don't shy away, though, because of water conservation considerations, from electronic solid state models. They are the coming thing."

The next task that has to be performed is to sequence the system though its zones, turning water to each station on and off.

"And with water conservation efforts, more people are using moisture sensors to eliminate a water cycle after a recent rainfall or when the soil is already moist," Essenwein noted. "If there is one, familiarize yourself with it. If there isn't one, it's a good idea to install one."

Next step is to locate the valves by starting at the wiring on the controller. Check the wiring using an ohmmeter. If you retain the account for



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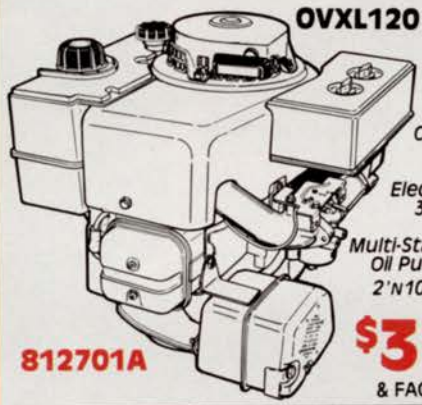

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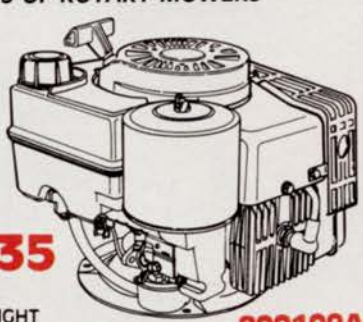

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The first step when installing an irrigation system is to locate a site plan through the company under contract. Even if you need to go all the way back to the original landscape architect, do it.

more than one year, "it's a good idea to do it every year," Essenwein suggested.

If a valve is not working, the problem is either the controller, the valve or a break in the line. Essenwein pointed out that Progressive Electronics has a device that will track underground wires to minimize trenching damage. He said to make sure to disconnect the valve wire from the controller and hook up an earth ground before doing anything else. "If you don't have success with the Progressive Electronics unit," he noted, "some irrigation contractors offer this as a service." When the break is found, repair it using waterproof connectors.

The newer, solid-state models are more versatile in their programming capabilities and lend themselves more easily to drip irrigation.

"Not having waterproof wiring is the single most important factor if there are problems," Essenwein said. "Put them in at the valve, if they are not. If the wire to the valve is pulled tight, then you might even need an extra length of wire."

Too much water pressure on the line creates a lot of problems. Check the flow control and adjust it as necessary.

If, during testing, the head gets stuck in the "up" position, you'll have to remove sand and debris from the seal. Replace it now, before it is broken off. You may have to take the unit apart and clean the filter screen, too.

"For heads above grade, flexible PVC pipe is available to correct the problem," says Essenwein (see illustration). "For loose soil around the head, ground stabilizers are available. And for broken heads or nozzles, the Geyser-Off is a remarkable device that cuts water to the head or nozzle off when water is flowing through at a high rate."

Take lots of notes during your first run through the system.

"All irrigation systems are bound to fail from time to time," concludes Essenwein. "If you understand the product, it'll be easier to choose something that will do the right job." **LM**

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Circle No. 140 on Reader Inquiry Card

Two ocean holes are at sea level, but inland the elevation gets as high as 800 feet on the Kapalua golf courses.

PARADISE FOUND

Maintenance at the Kapalua, Hawaii, golf courses is sometimes a 24-hour-a-day proposition. But superintendent Short Honma and his people have risen to the occasion in the past. And the course shows it.

It is 5 a.m. the day of the 1987 Isuzu Kapalua International Pro-Am. It is the Kapalua Bay Golf Course. A fleet of triplex mowers moves up and down the fairways. The crew's only light comes from the headlamps of pick-up trucks.

Because of the six-hour difference in time between the Hawaiian island of Maui and the Eastern Time Zone back on the mainland where the matches were being shown on television, tee times were very early in the morning, which meant that superintendent Short Honma and his lieutenants were up even earlier.

And there were complications, too.

"Because of the rain earlier in the tournament, I ended up using all my extra triplexes. I couldn't take the big equipment out," notes Harry Pali.

And what better superintendents for the Kapalua Golf Courses than native Hawaiians? Pali, in particular, knows the land well: he was born on what is now the fifth hole of the Bay course.

Besides Honma and Pali, Kent "Herb" Nishigima and Andy Tiara round out the managerial team of the two 18-hole golf courses, known as Bay and Village. Honma oversees the entire operation. Nishigima is supervisor of the Bay course and Tiara super of the Village course.

Lovable tourists

Kapalua is situated in the northern portion of the Hawaiian island of Maui. Visible across the water, providing an idyllic background, is the island of Molokai. Tourists love the place.

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Circle No. 119 on Reader Inquiry Card

Teamwork is evident among top management: left to right, Short Honma, Andy Tiara, Harry Pali and Herb Nishigima, who split the work.

who oversees up to 43 employees.

The biggest event of the year is the Isuzu Kapalua International, played on the 6,731-yard Bay course. The 5,981-yard Village course, however, is referred to in one tourist brochure as "Hawaii's most challenging." Both are open to tourists.

And because of the largely tourist clientele, a large emphasis is put on beauty. Most of the colorful vegetation has been imported: bougainvilla, African tulips, eucalyptus trees, Christmas berries and a Madagascar olive that is called the "Autograph Tree."

Pali is in charge of special projects, which last year included installation of a new sod farm, new tees on some holes and a complete renovation of one Bay course hole.

The original designs came from Arnold Palmer and Ed Seay. Pro golfer Ben Crenshaw has designed an additional 18 holes on which construction begins this month.

"The course had to be designed around 'no-man's-land valleys'," says Tiara of the Village course. One of Kapalua's attractions is its radical change in elevation because of its proximity to the ocean. Two ocean holes are at sea level, but inland the elevation gets as high as 800 feet.

The clayey soil has to be continually aerated.

Hard as a rock

One of the major problems is compaction, due in part to the traffic but due also to a clayey soil that has to be continually aerated. The tradewinds also tend to dry the course quickly, complicating the problem.

Common Bermudagrass fairways are mowed at ⅝-inch in the winter and at ½-inch in the summer on the Village course and at ½-inch on the Bay course, where most of the championship matches are played. "We groom the course finer for tournaments," notes Pali. Stimpmeter readings rise to 8½ for tournaments from the "high sevens" for non-tournament play. "Our goal every year is to make the course the best possible for the International," adds Tiara.

Village Course greens are mowed at 3/16-inch in winter and ⅛-inch in summer and tees at ¼-inch. Rough areas are at a standard 1½ inches.

As preparations continue for the new course, excitement grows. Tifdwarf sod is being grown on the four-acre sod farm for the fairways of what will be called the Plantation Golf Club.

Before Kapalua opened in 1974, Honma worked at Sea Mountain Golf Course on the island of Hawaii. None of the other three have previous golf course experience. Tiara went from the hotel business to the golf business; Nishigima was a construction worker. They all started as laborers at Kapalua and worked their way up the ladder. To a man, they like working for Honma.

"Short is strict, but an honest and straight-forward kind of guy," observes Tiara.

Honma's direction shows up in solid team management and respect for co-workers evident on the staff. And they need it, to keep the Kapalua golf courses among the most popular in the world. **LM**

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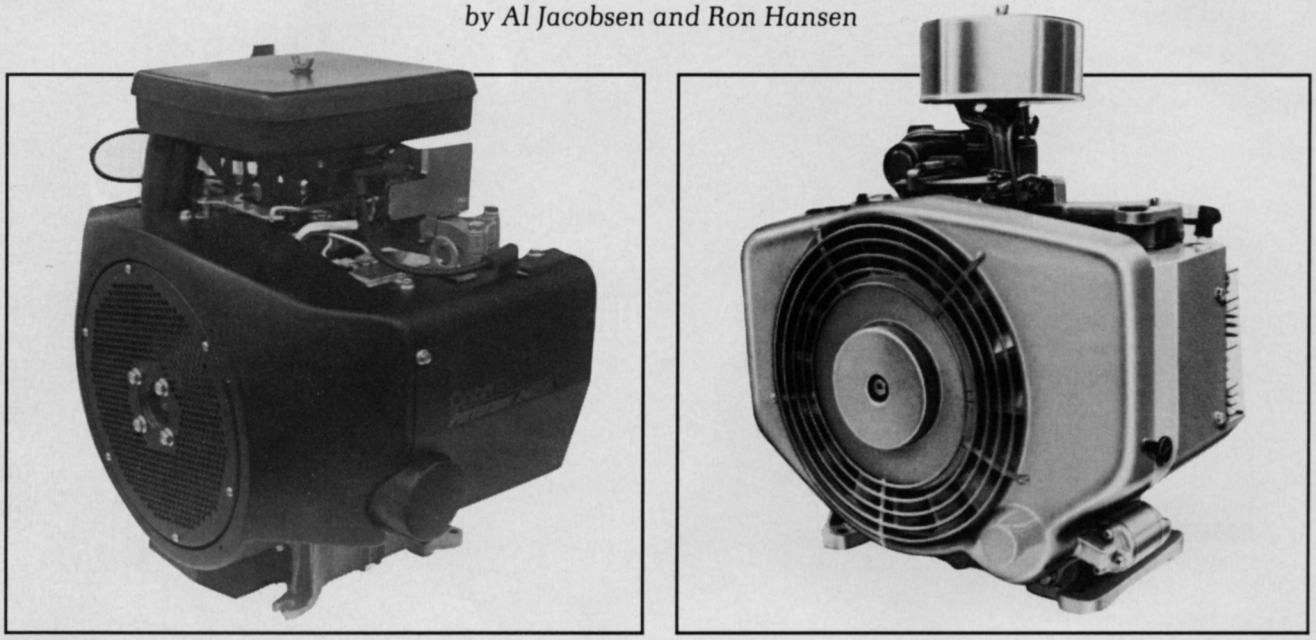
Circle No. 106 on Reader Inquiry Card

FILLING THE ENGINE TRAINING GAP

The high-tech features of today's internal combustion engines require a new approach to training.

by Al Jacobsen and Ron Hansen



The improved technology of modern engines is evidenced by this new 24-hp engine (left), which is of comparable size to the older 13-hp model.

Revolutionary changes in automotive engine design have made the engines used on today's commercial turf equipment considerably better than those of just a few years ago.

Engines in the 10 to 25 hp range now boast many high-tech features, including fuel injection, electronic ignition, pressure lubrication and more. Today's engines also offer more horsepower in a smaller package. For example, today's typical 24-hp engine takes no more space than many engines in the 10-14 hp range of just 10 years ago.

While these improvements bring a host of benefits to users of commercial turf equipment, the advantages are not free. As engines have become more sophisticated, they've also gotten more complex.

Today's engines last longer, are more reliable, run quieter and use less fuel than ever before. But at the same time, the increased level of technology, closer tolerances and the need to more carefully assure proper air flow and lubrication have all placed greater demands on service.

Al Jacobsen and Ron Hansen work for Onan Corp. in Minneapolis, Minn. Jacobsen is manager of service training and Hansen is engine division merchandising manager.

More training needed

As engine maintenance gets more important and repairs more critical, many equipment owners and operators are finding they need added training support from engine manufacturers to get the most out of their lawn care equipment.

In typical turf equipment, the engine accounts for about one-third of the initial cost and at least half of the continuing maintenance cost. Equipment downtime often costs as much as $100 per hour, not to mention the poor customer service that often follows.

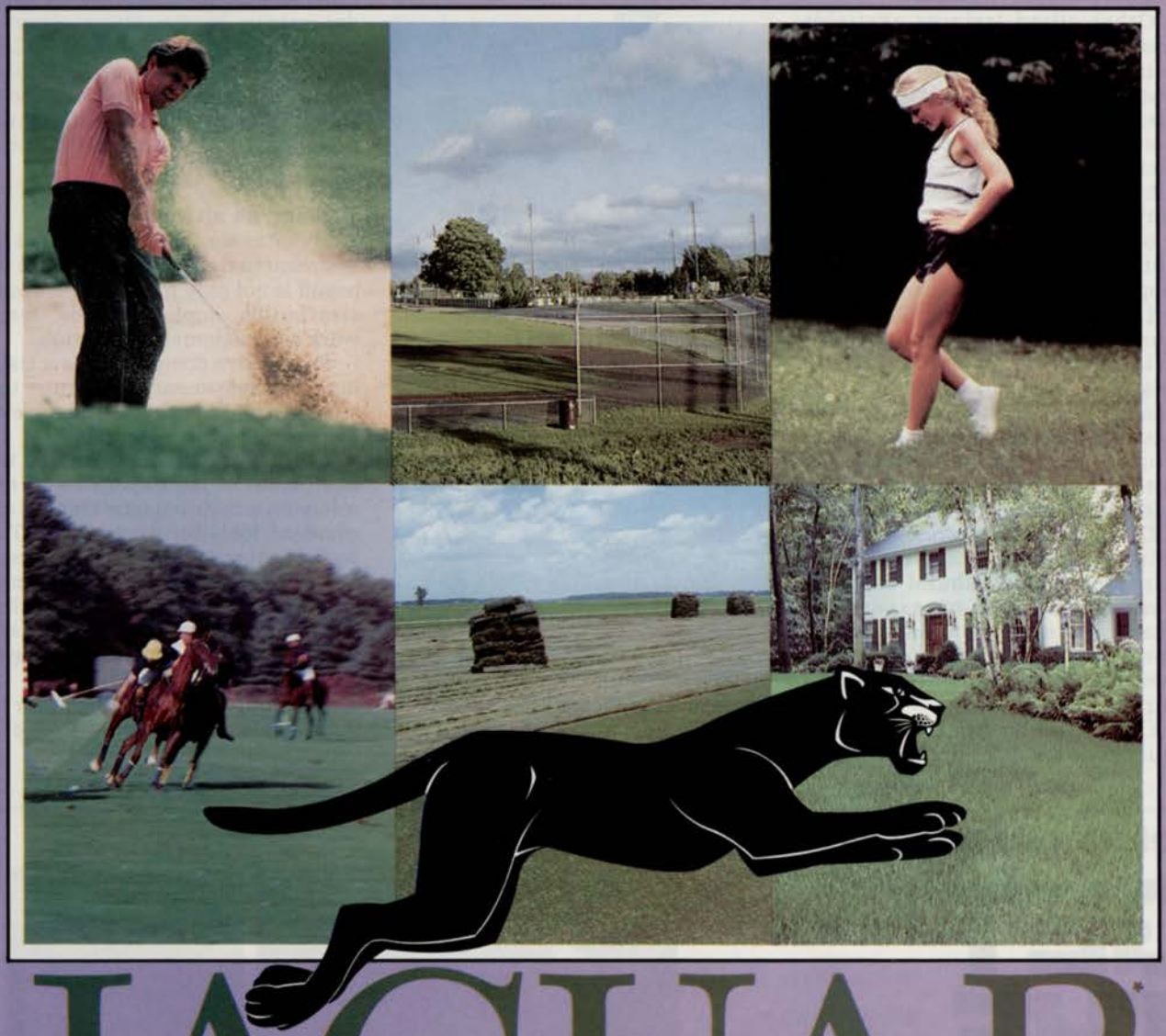
Users at all levels are finding it pays to have an awareness and understanding of engine fundamentals. The need for more knowledge extends beyond service personnel. They need proper training to ensure maintenance and repairs are done in accordance with factory specifications. But operating efficiency improves dramatically when people at all levels of the organization acquire better knowledge of the service function.

In some companies, everyone from service personnel to operators, first-level maintenance personnel, supervisors and, in some cases, administrative personnel attend factory-sponsored training sessions on engine maintenance. Reports from these attendees give convincing evidence that such company-wide training results in improved operating efficiency and reduced cost.

Course depth increasing

Engine manufacturers have been quick to respond to the user's needs for more training by offering specialized courses and innovative teaching techniques. Onan Corporation, manufacturer of one- and two-cylinder gas engines, is a good example. The company offers specialized training on each product line. The standard engine training class lasts a full week and includes not only engine repair and maintenance, but ways to increase engine longevity,

Excellent Overall Performance



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economy and serviceability.

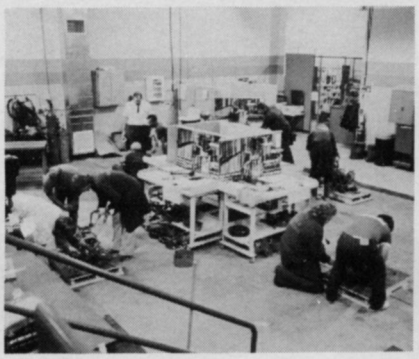
Other allied training available from manufacturers in a variety of forms includes customer relations, electrical and mechanical fundamentals, even telephone etiquette and more. For larger groups, companies offer on-site training in the field and tailored training to a particular company's needs.

Some manufacturers' training facilities have fully equipped service shops and modern classrooms manned by a full-time staff. The classrooms today are vastly improved over training facilities of the past. In Onan's courses, for example, video monitors are used to zoom in on the most minute engine parts as the instructor explains to students the workings and adjustments of each engine component.

Company trainers stress hands-on training, including complete engine teardown, repair, rebuild and test. Most of this hands-on experience takes place in service training shops, where complete facilities are set up to simulate typical maintenance and repair operations.

Onan's facility has the tools and equipment to support training among other things, in valve grinding, cylinder resizing, bearing fitting, electrical test and engine evaluation. Continuing education and updates to existing classes on videotape are also offered. And for those really tough problems, there's an 800 hotline number for immediate help.

Equipment owners have found that it pays to get additional training



Modern training facilities at Onan feature a fully equipped service shop and staffed classroom.

Training as an investment

Study after study has shown that investment in training pays off. And the payoff is not only monetary. Training also builds employee pride, teamwork and customer satisfaction.

Progressive companies view training as an investment in the future that is essential to compete in today's ever increasing-technical world.

Engines are too complex and turf equipment is too expensive to rely solely on a maintenance manual and standard tools for proper care. Turf equipment operators, service personnel and supervisors now need more extensive skills to adequately do their job. It takes a dedicated training staff with a properly equipped training facility to impart those skills.

Call your engine manufacturer for information on training best suited for your needs. **LM**

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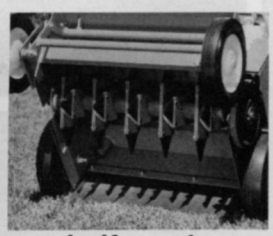

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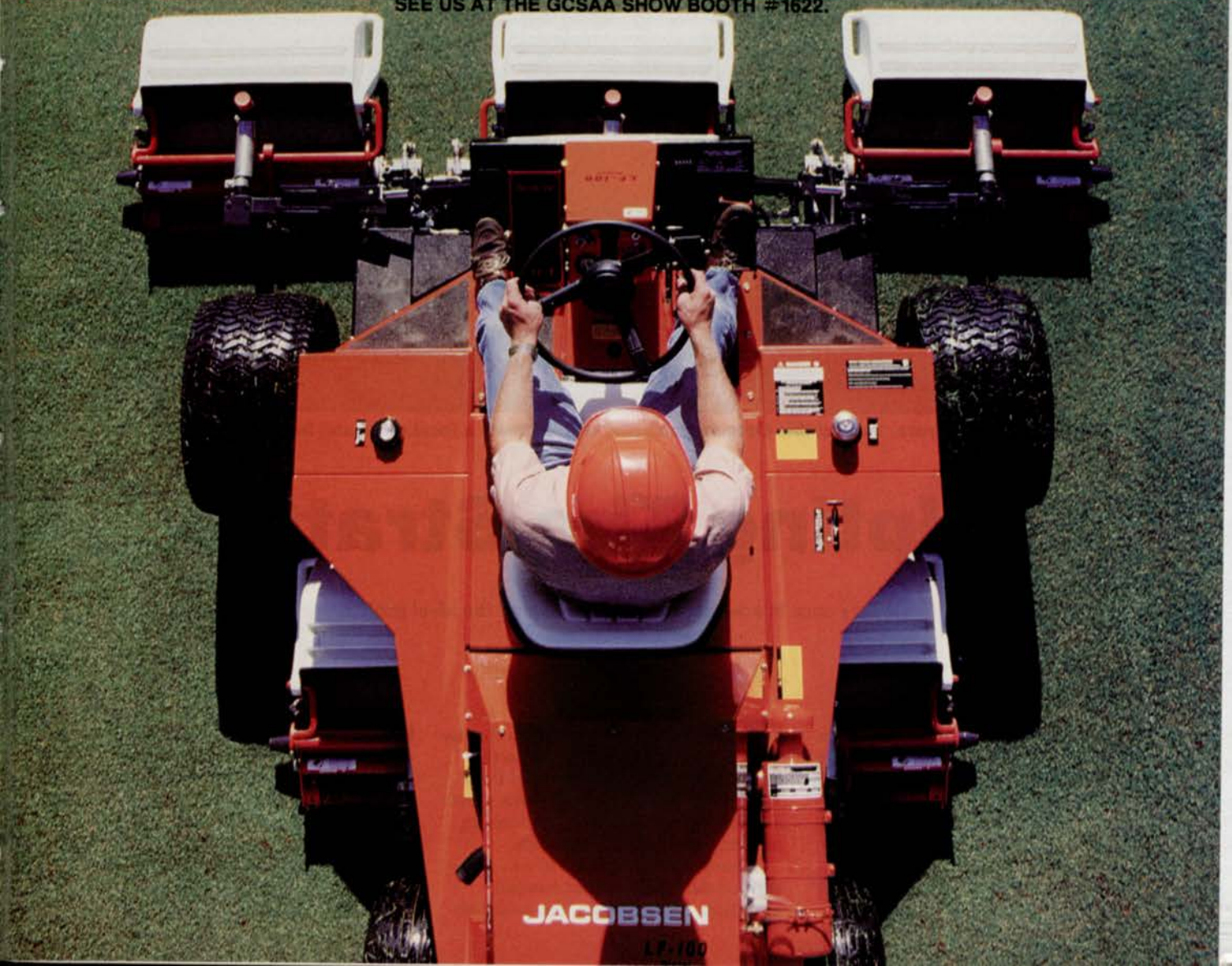


Kesterson preserved several trees at this Oregon residence, which create a focal point and balance the front entry.

Sculpting The Stratford

Every once in a while, a designer is offered the ideal project.

by Will Perry, managing editor

In many ways, landscape designer Daniel L. Kesterson couldn't have asked for a better assignment than to landscape The Stratford, a West Linn, Ore. residence to be featured in the summer house show, *Tour of Elegance*.

There was a nice budget to work with. About $70,000 worth of landscaping had been allotted for the 16,000 sq. ft. lot. Also, because the home was to serve as a model for a local developer, Kesterson was given a great deal of freedom in choosing and implementing his design.

There were however, some serious deficiencies that needed attention. For example, the architect had miscalculated the site elevations on the downhill side of the house, leaving 10 feet of the foundation exposed. Also, more than eight feet of earth washed into the street off the house's north facade.

Kesterson, a designer with Drake's 7 Dees Nursery & Landscaping, Portland, responded to these

challenges by creating an elegant, functional landscape that solved the design flaws while providing the intimate, private setting the house and neighborhood demanded.

"The most cost-effective and efficient way to bridge the gap between the foundation and the ground level was to bring in a number of boulders from another site we were involved with across the Columbia River," says Kesterson. The boulders, weighing as much as 5,000 pounds each, were laid in by back hoe at the base of the house and along the sidewalk. The walls were complemented by a brick wall that levelled the ground along the house entrance.

Perhaps the most unique feature of the landscape is an artificially created stream that runs through the yard and into a pool at the entry area. The water is generated through the stream via a submersible pump and cascades over stones specially selected and placed by Kesterson. Invisible from the street, the stream "is a nice surprise when you come around the corner to the entrance," says Kesterson.

He handpicked undamaged, natural-looking stones that have mosses in place for the streambed. "The stones should be shaped to fit into the flow of the stream." The larger stones were installed by using gunite and the smaller stones were placed later. A second water feature is located next to the back patio. It is a three-level, 40-gallon pool that operates via a remote pump. Its placement beneath a kitchen window creates a trickling water sound "while preparing a gourmet's delight," says Kesterson.

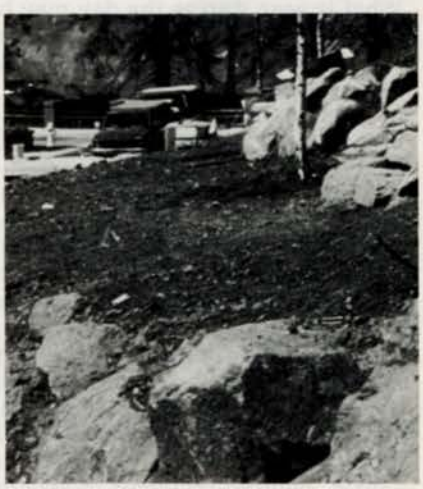
Concerning the front of the house, Kesterson said he was fortunate that the three large Japanese maples and Douglas firs were preserved as they provide a balance between yard and house and establish a relationship with the deciduous trees in the area. Also in the front yard is a nine-foot Aristata pine that was brought in from another of the company's sites.

"I used several different grasses around this area and I feel it really blends in well. It creates the natural feeling I was looking for.

"There's a noticeable trend in the area to implement perennials and create the feel of an English garden," says Kesterson of the numerous varieties of perennials in and around the front tree bed. These include Fountain grass, Purple Noose Stripe, White Yarrow and Baby's Breath.

The backyard features a formal, three-level rose garden where 10 varieties of hyrid-T roses are in blossom. "The three garden levels in the backyard presented a classic opportunity to use roses. After all, this is the Rose City," says Kesterson, adding, "Overall I'm very happy with the way the project turned out." **LM**

This "Ottercrest" bronze sculpture comes into view as you near the front entry. It is placed close to the stream, which is also invisible from the street. An excellent view of the stream is from the Stratford's living room.



Boulders as large as 5,000 pounds each were laid in by back hoe to create a level area at the front entry.

Nightlighting can enhance a property's image and increase value.

TO LIGHT AT NIGHT

Selling nightlighting to owners and developers can be very difficult, unless you tell them exactly why it's such a good idea.

Incorporating lighting into landscape design allows the designer to use entirely different concepts. What is seen during the day may be entirely different from what is seen at night. Lighting permits the designer to focus the viewer's attention.

Many landscape architects and other green industry professionals would love to add lighting, or better lighting, to various sites. The problem is convincing bottom-line-oriented owners. Also, given the relatively high cost of energy, owners are likely to have a mindset that is predisposed to energy conservation.

Any analysis of lighting must consider the bottom-line value of its functions. This is exactly what lighting management does. Bottom-line values of factors such as reduced vandalism, reduced incidents of assault, lowered exposure to liability, and other factors greatly exceed the cost of the lighting needed to attain these values.

The eyes have it

When inadequate lighting is provided, it often goes unnoticed because of our eyes' amazing ability to adapt. Nonetheless, many subtle, but important, negative effects can result. For example, an employee who is continually affected by glare may still be able to perform visual tasks, but he or she may also be subject to "unusual" eye fatigue or headaches—conditions associated with stressed adaptive eye muscles. Similarly, low-quality lighting or insufficient amounts of lighting in office areas result in lower productivity, because poor illumination results in more time being needed to perform tasks. It also increases the likelihood of errors being made.

The 26 points made in the related article clearly indicate the different effects that lighting can have outdoors. They also suggest the proper method of approaching outdoor lighting management.

Once an owner or manager becomes familiar with key lighting issues, the next step involves retaining effective technical support. Numerous professional lighting consultants are members of the Illuminating Engineering Society of North America (IES, 345 East 47th Street, New York, NY 10017) and its local chapters (sections) throughout the United States.

Note, too, that manufacturer's representatives also are in a position to lend technical assistance. Many electrical contractors have fully staffed lighting design departments, and many electrical distributors also have personnel on staff who can be of assistance. The local electrical utility may also have personnel who can help, or at least should be in a position to iden-

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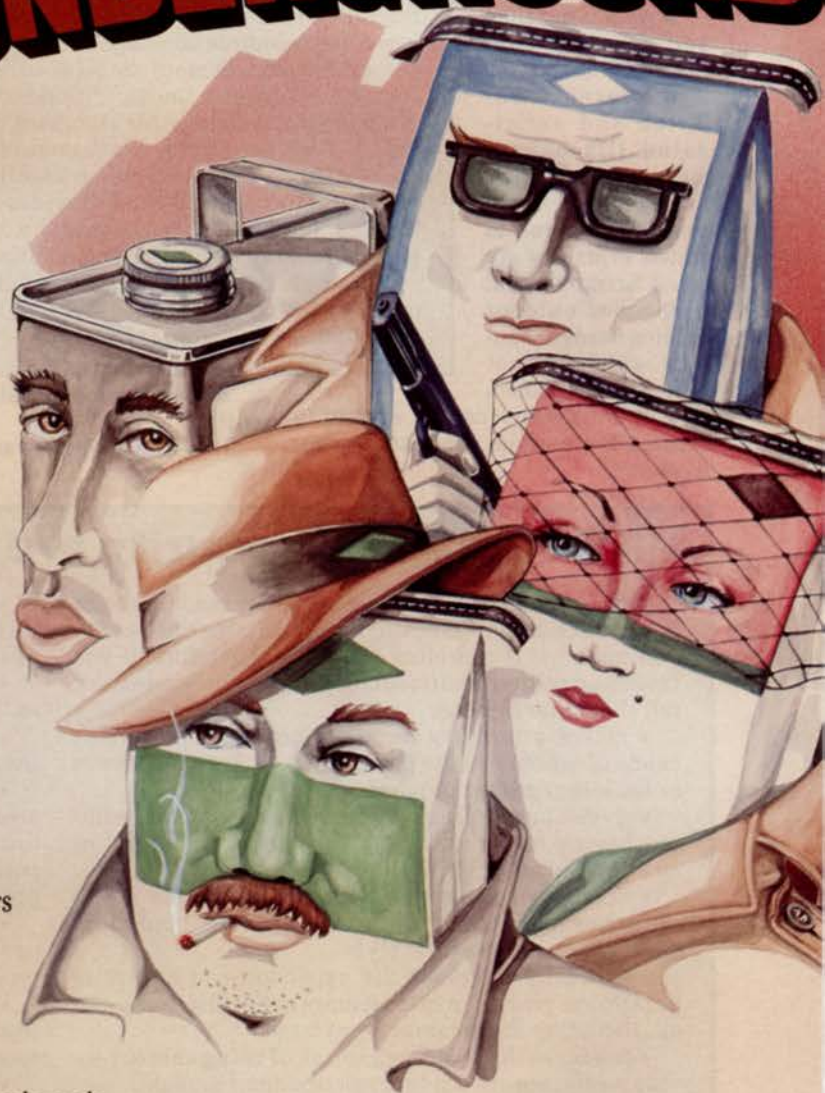

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—Roger Fairways, *Crabgrass Gazette*

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tify area consultants who can assist.

A lighting specialist's first task usually will be evaluating the existing outdoor lighting system for:

- what is installed and how it is controlled,
- present condition and anticipated life expectancy,
- annual O&M costs, the degree to which functions are being accomplished,
- other outdoor lighting needs or benefits which are not now being attained,
- options which can be applied to accomplish various goals and objectives and
- their related initial and life-cycle costs.

It will be difficult to assess with any degree of precision exactly how certain lighting system improvements will affect other issues, such as reduced tenant turnover. Nonetheless, certain reasonable assumptions can be made and, accordingly, bottom-line values can and should be applied. This approach gives decision-makers a far better data base on which to make decisions.

And, when all is said and done, it likely will be found that effective lighting developed through a program of lighting management can be one of the single most profitable investments that an owner can make. **LM**

Sources

For the astute owner or manager, the very first step in effective outdoor lighting technical management is to obtain more information about lighting and what it can do.

One of the best sources of information is the National Lighting Bureau, which publishes a variety of guidebooks on lighting. Each is written in simple language and is extensively illustrated for easy comprehension. Some of the NLB's titles include: "Getting the Most from Your Lighting Dollar," "Conducting a Lighting Systems Audit," "Lighting Energy Management for Offices and Office Buildings," "Lighting Energy Management in Retailing," "The Energy Saver's Guide to Good Outdoor Lighting."

Each sells for just $5 and provides discussion on the benefits of lighting, important issues about the type of facilities and instructions about numerous lighting management options.

A complete directory of NLB publications is available without cost by writing to National Lighting Bureau, 2101 L Street, N.W., Suite 300, Washington, D.C. 20037.

Beauty and security are two lighting effects

Planned lighting can do many things for the landscape. By familiarizing your customers with its many benefits, you may find it can often sell itself. Therefore, if you intend on selling additional lighting to your customers, tell them that lighting:

- makes a building more noticeable to passers-by (some of whom may be prospective tenants, customers or building/project purchaser);
- gives a building a more dramatic appearance without having to invest in any substantial structural or facade changes;
- creates an integrated "wholeness" to the entire project even though it may comprise several buildings of different architectural style;
- generally upgrades the appearance of an entire building or project, making it more appealing to one and all, including the community at large;
- enhances the building's image of being able to provide a safe, secure outdoor environment at night;
- makes it easier for people to find their way at night and quickly identify the proper path to take;
- makes the outdoor parking lot and surrounding areas/walkways more immune from tripping/slipping accidents;
- reduces the likelihood of a tenant or guest being assaulted in the parking lot or other outside areas;
- makes the outdoor parking lot safer in terms of reducing the potential for vehicle-object, vehicle-vehicle, vehicle-pedestrian accidents.
- reduces incidents of vandalism in the parking lot.
- reduces incidents of break-ins to and theft of tenant/guest/customer autos parked outdoors at night;
- reduces incidents of vandalism affecting the building itself (spray paint, broken windows, etc.) and grounds (broken plantings, broken lighting globes, etc.);
- helps reduce the likelihood of building break-ins.
- enhances the ability of passers-by, guards, etc., to spot potential intruders and provide an effective identification to authorities;
- reduces the cost of security patrols around the building and grounds while enhancing their effectiveness;
- lowers exposure to legal liability for problems such as "endangering the safety of an invitee";
- may reduce the cost of liability and other insurances;
- allows you to avoid the uninsurable costs associated with defending a liability action (complying with discovery, responding to interrogatories, attending depositions, being in court, meeting with attorneys, lost productivity and piece of mind, etc.);
- may help you avoid the negative publicity which can flow from assaults and similar incidents on project property or immediately adjacent to it;
- reduces the time required to clear parking lots and roadways from snow and otherwise reduce the cost of snowplowing;
- reduces the frequency and extent of damage caused by the snowplow blade, thus reducing the related costs and inconveniences associated with snowplowing;
- in the case of multi-family residential properties, provides space for a variety of nighttime activities without having to purchase more property or make costly improvements;
- reduces tenant turnover and the associated costs of turnover, such as painting/cleaning, advertising for new tenants, screening prospective new tenants, etc;
- justifies an increase in space rental/lease rates, and or the value of individual spaces or the entire building, due to improved safety/security, better appearance, etc;
- in the case of retail buildings or retail spaces in larger complexes, increases retail sales and, when applicable, increased sales-based rental income, and
- increases the marketability of space (or the entire building) due to improved safety/security, better appearance, reduced tenant turnover, higher rental/lease income, etc.

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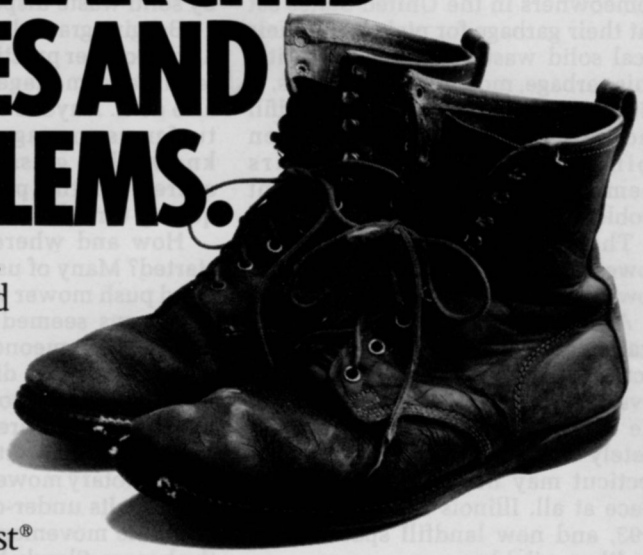

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Medalist North Mix	Fairways, tees, cart paths, wear areas.	Quality turf for high traffic areas. Clean mowing and disease resistant.
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Renovator Pro Mix	Problem solver for heavy traffic areas (athletic fields, golf tees, and fairways).	Penetrates compacted soils and combats *Poa annua.* Adaptable to most geographic regions.
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Landfill crisis may curtail bagging of grass

by William E. Knoop, Ph.D.,
Texas Agricultural Extension Service, Dallas

At least once a week millions of homeowners in the United States set out their garbage for pick up by their local solid waste disposal authority. This garbage, mostly in plastic bags, is usually carried to the sanitary landfill and buried. This process has been going on for years and years seemingly without any significant problems.

There is a significant problem, however, and it has a lot to do with how home lawns are managed.

According to information made available by the Environmental Protection Agency, within the next five to seven years as much as one-third of the nation's landfills may be completely full. By the year 1990, Connecticut may not have any landfill space at all. Illinois may run out by 1993, and new landfill space is not readily available.

Bagging to blame?

The connection between home lawn management and the shrinking landfill space has to do with bagging grass clippings. It's been found that in some of our neighborhoods as much as 50 percent of the solid waste pickup each week is nothing more than grass clippings. In one Texas city of 21,000 homes, during a one-week period in June, it was determined that the citizens placed some 700 tons of grass clippings neatly tied in some 31,000 plastic bags at their curbs for pickup by solid waste disposal.

Bagging grass clippings is primarily a homeowner practice, although some landscape management companies also do it. Anyone familiar with basic turfgrass management principles knows that grass bagging isn't required for the production of high quality turf.

How and where did bagging get started? Many of us grew up with the hand push mower with no bagger and our lawns seemed to get along just fine. Then someone put a catcher on the mower so we didn't have to mow as often and all those unsightly grass clippings that were being left on the lawn were eliminated.

The rotary mower was a natural for bagging. Its under-deck design facilitated the movement of clippings into the bagger. Slowly but surely, bagging grass clippings has become associated with perception of lawn quality. Homeowners generally believe that you must bag your grass clippings in order to have a great lawn.

More frequent mowing

Those familiar with turfgrass management know these statements are not true. After all, how many golf courses bag their clippings? The likely truth is that we've slowly grown a little bit lazy about the way we care for home lawns. Rather than mow them as often as we should, we tend to mow only once a week. That leaves what some consider an unsightly amount of clippings on the lawn. As a result, the mower has evolved from one that had a simple bagging attachment to a machine with a permanent bagging feature. In fact, it's hard to buy a mower today that doesn't bag!

Changes are needed if the trend of filling valuable landfill space with grass clippings is to be reversed. And homeowner education has to be the No. 1 goal of lawn management firms.

Most homeowners have never been taught how to manage a lawn. They have learned by following their parents' example or from watching neighbors. Most neighborhoods have a lawn expert who's more than willing to dispense advice.

Another necessary change has to do with the lawn mower. We need a machine that will, when the lawn is cut only once a week, chop up the clippings fine enough so they will filter down to the soil surface. Key to this mowing concept must be using a reasonable management approach, including a fertility program that stresses the use of slowly soluble nitrogen and reasonably high levels of potassium.

Study changes attitudes

In a pilot educational program in Plano, Texas, many homeowners said grass clippings couldn't be left on the lawn under any circumstances. There was a general belief that these clippings would automatically cause a thatch problem.

Some 20 homeowners agreed not to bag their grass clippings for one year and to follow a prescribed maintenance program. At the end of the year, the overall reaction was that it was far easier to mow the lawn every five days or so than to mow it once a week and mess with the bagger.

The poorer lawns improved and the good ones stayed the same under the program.

Everyone's cooperation is needed if the landscaping industry is to make these changes. We have helped build this bagging monster, and we must take the lead in stemming the flow of grass clippings that unnecessarily clog our shrinking landfill space. **LM**

As America runs out of landfill space, the practice of bagging grass clippings needs to be reevaluated.

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Circle No. 280 on Reader Inquiry Card

Tall fescues changing for the better

by Robert Shearman, Ph.D., University of Nebraska

Tall fescues are showing continued acceptance as a turfgrass species, particularly since the development of the new turf-types. The new cultivars have even finer texture and lower growth habits than their predecessors.

These new, low-growing types, called dwarf-type tall fescues, can easily be classified into four groups: dwarf-types, turf-types, intermediate-types and forage-types. Presently, the term "fine fescues" is used by many producers and users to describe the new turf-types. This terminology is confusing, since fine fescue and fine-leaved fescue have been used to describe creeping red fescue, chewings fescue, and hard fescue species.

RELATIVE CHARACTERISTICS FOR SELECTED TALL FESCUE CULTIVARS

Cultivar	Type	Rooting Depth	Wilting Tendency	Drought Avoidance	Type	Topgrowth	Clipping Yield	Verdure
Kenhy	Forage	Intermediate	Very High	Low	Forage	Very High	Very High	Low
Pastuca	Forage	Shallow	Very High	Low	Forage	High	Very High	Low
Kentucky-31	Intermediate	Very Deep	Low	Very High	Intermediate	High	Very High	Intermediate
Houndog	Turf	Intermediate	Intermediate-Low	Intermediate	Turf	Intermediate	Intermediate-Low	Very High
Mustang	Turf	Deep	Intermediate	Intermediate	Turf	Intermediate	Intermediate	High
Trailblazer	Dwarf	Deep	Intermediate-Low	Intermediate	Dwarf	Very Low	Low	Very High
Monarch	Dwarf	Intermediate	Intermediate	Intermediate	Dwarf	Very Low	Low	High

**Based on University of Nebraska turfgrass research.*

Forage-types

Forage-type tall fescues include cultivars like Alta, Kenhy and Pastuca. Forage-types have been used as turfs with varying degrees of success, depending on the turf's requirements. Cultivars in this group are characterized by rapid leaf growth and vertical elongation, coarse texture, light-green appearance and lack of tolerance to low mowing.

Recent studies at Nebraska have demonstrated that cultivars like Pastuca and Kenhy have high water use rates. They also have intermediate rooting depths and high wilting tendency when maintained under turfgrass conditions. Their high water use rates are associated with rapid vertical elongation rates and open canopies.

Forage-type tall fescues are probably most suited for use in roadside or utility turfs.

Intermediate-types

Intermediate-type tall fescues like Kentucky-31 or Clemfine generally have characteristics like forage-types. But they tolerate frequent close mowing better than cultivars like Alta or Kenhy.

Kentucky-31 has a rapid vertical elongation rate and an intermediate canopy density. Its high water use rates are comparable to the forage-types. But it tends to have a low wilting tendency and produces a very deep root system under turfgrass conditions.

Intermediate-type tall fescues are most suited for low-maintenance turfs.

Turf-types

Turf-type tall fescues include cultivars, such as Rebel, Mustang and Adventure (actually the list of these cultivars is quite long). Turf-types are characterized by: lower leaf elongation rate, slower vertical elongation rate, finer texture, greater canopy density and a darker green color than the forage- or intermediate-types.

These cultivars differ in their water use rates, but generally rank medium to low in water use as a group. They differ in their rooting depths and in their ability to avoid drought symptoms.

Adventure produces a very deep root system, has a very low wilting tendency. It also tends to avoid drought symptoms better than other cultivars tested. Rebel, on the other hand, produces a shallow to intermediate root system, has high wilting tendency and low drought avoidance, but recovers rapidly after periods of drought stress.

The lower water use rate associated with the turf-types is closely associated with slow vertical elongation rates and dense canopies.

Turf-types tend to have high to very high wear tolerance ratings. Their wear tolerance is associated with high verdure density, high shoot density, high load-bearing capacity and high cell wall production.

Turf-types also have a higher thatching tendency than the forage-types. Thatching tendency is closely associated with cell wall production and verdure density.

Dwarf-types

Dwarf-type tall fescues are characterized by cultivars, like Monarch, Trailblazer and several experimental lines that are likely to be released soon. These cultivars have many of the same characteristics of the turf-types, but tend to have even slower vertical elongation rates and finer texture.

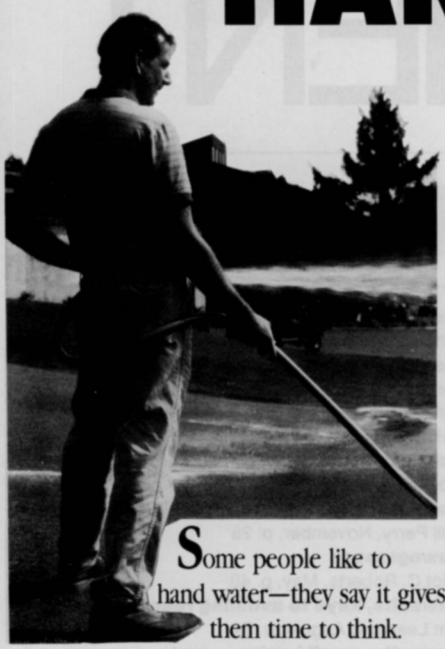
Dwarf-type tall fescues are characterized by clipping-yield-to-verdure ratios of less than one. In fact, some dwarf-types produce half the amount of clippings as they do verdure. Since verdure is the green vegetation beneath the mowing height, this characteristic is very desirable to turfgrass managers concerned about reducing mowing but also maintaining desirable turf.

Water use for dwarf-types ranked from medium to low. Their water use rate was closely associated with high verdure density and low vertical elongation rate. Dwarf-types differ in root production and distribution. This difference in root production and distribution is important because shallow, nominal rooting has been associated with dwarf-types in other grass species. Dwarf-type tall fescues had cultivars with root production and distribution as great or greater than some of the intermediate- and turf-types.

Improvements are being made rapidly with turf-type and dwarf-type tall fescues. Turfgrass managers should pay close attention to turfgrass research information developed in their area. This information will allow turfgrass managers to identify cultivars with the best potential for use in their area.

Many of the tall fescues are currently being evaluated in the National Tall Fescue Test. Data from these trials are available through your local researchers and industry representatives. Use all of the available information to determine the best cultivars for your intended use. **LM**

DOES YOUR TURF PLAY HARD TO WET?



Some people like to hand water—they say it gives them time to think. For most it's a necessary evil that takes valuable time away from more important things. Using AQUAGRO® soil wetting agents regularly will reduce hand watering, which will either cut into your daydreaming time, or free you and your crew to do other things...it depends on your perspective. *And that's not all AQUAGRO does for you.*

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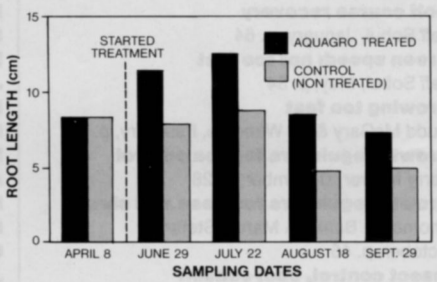
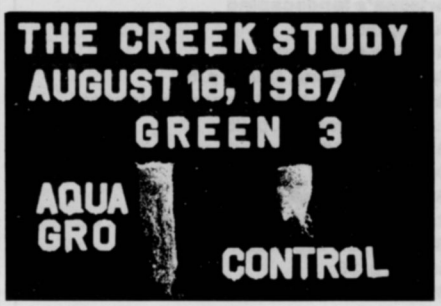


In addition to making more moisture available to roots, AQUAGRO improves the distribution and efficacy of water soluble fertilizers and pesticides. It helps move them through heavy thatch.

University research shows AQUAGRO can reduce the severity of fungus diseases by eliminating surface moisture conditions that promote fungal growth.

The photo shown here is part of a research field trial where AQUAGRO reduced water related problems caused by soil layering conditions. AQUAGRO allowed deep root penetration by promoting water movement through the layers.



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LANDSCAPE MANAGEMENT

1988 ARTICLE INDEX

Aeration
Jeff Sobul, June, p. 18
A herbicide primer
W. Powell Anderson, January, p. 20
Aquatic weed control, legislation and
John E. Gallagher, June, p. 32
Arizona's landscaping
June, p. 56
Athletic field drainage
Stephen W. Baker, March, p. 68
Athletic fields: cool-season calendar
J.R. Hall III, January, p. 26
Athletic field tips
December, p. 36
Bankruptcy and Chapter 11
Rudd McGary & Ed Wandtke, August, p. 42
Black layer: the black death
August, p. 38
Blacklick Woods Metro Golf Course
Jeff Sobul, January, p. 52
Brynwood Country Club
August, p. 32
Candlestick Park, Pope visits
Heide Aungst, March, p. 24
Cavotta's Cleveland
Heide Aungst, June, p. 49
Compact tractors
Ken Moehle, October, p. 30, November, p. 34
Corporate structure
Rudd McGary & Ed Wandtke, March, p. 64
Deer Creek Golf Course
December, p. 22
Diseases of cool-season turf
Noel Jackson, May, p. 48
Diseases of warm-season turf
Robert Haygood & Walker Miller, June, p. 21
Diversifying your business
Rudd McGary & Ed Wandtke, July, p. 44
Drought resistance
Jeff Nuss, January, p. 32
Engine irregularities
John Peterson, July, p. 30
Equipment tracking
Jay Holtzman, November, p. 37
Fertilization, new concepts in turf
John R. Street, February, p. 38
Fertilizers and soil fertility
Bill Bedrossian, August, p. 46
Fine fescues
C.R. Skogley, July, p. 24
Golf course boom
Jerry Roche, January, p. 38
Golf course recovery
Jeff Sobul, January, p. 64
Green speed: not too fast
Jeff Sobul, May, p. 34
Growing too fast
Rudd McGary & Ed Wandtke, February, p. 82
Growth regulators for poa control
Terry McIver, December, p. 28
Growth regulators for trees and shrubs
Thomas J. Banko & Marcia Stefani, October, p. 45
Insect control, cool-season
Harry D. Niemczyk, May, p. 25
Insect control, warm-season
Patricia Cobb, April, p. 60
Insecticides, soil-applied systemic
Whitney S. Cranshaw, June, p. 38
Insurance talk
James H. Leatzow, February, p. 76
Irrigation economics
Jeff Sobul, June, p. 46
Landscape manager of the year
November, p. 48
Lawn care: the customer as king
Will Perry, November, p. 28
Lawngrasses
Eliot C. Roberts, May, p. 40
Lawsuits, keys to avoiding recreation
Jim Leatzow, August, p. 54
Lawsuits, small business and
Edward R. Court, November, p. 60
Layoffs, the cost of
Rudd McGary & Ed Wandtke, November, p. 58
Library, a landscapers' home
September, p. 28
Lion Landscaping
Jerry Roche, December, p. 42
Management committees
Rudd McGary & Ed Wandtke, January, p. 80
Mowers: using the right tool
April, p. 24
Mulkern Landscaping
Heide Aungst, February, p. 30
Old Marsh Golf Club
January, p. 44
Ornamental grasses
Jeff Sobul, March, p. 76
Overseeding, winter
A.R. Mazur, October, p. 52
Part-time help
Rudd McGary & Ed Wandtke, June, p. 72
Poa annua problems
Eliot Roberts, December, p. 30
Perennial gardens
Ann Reilly, March, p. 42
Poa, putting it in its place
July, p. 40
Preston Country Club
Carl Kovac, December, p. 38
Rights-of-way: safe track record
July, p. 38
Seed blends
Will Perry, August, p. 24
Seed report: so demanding
Jerry Roche & Jeff Sobul, October, p. 36
Snow: clearing profits
Jerry Roche, November, p. 44
Soil management
Paul E. Rieke, April, p. 74

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Circle No. 125 on Reader Inquiry Card

Spanish Bay
January, p. 58
Spin-grinding reel blades
Roger Rosenquist, March, p. 34
String trimmers
Jeff Sobul, April, p. 50
Sulfur in turf management
Nick Christians, March, p. 84
Super Bowl XXII: super turf
Heide Aungst, April, p. 16
Tax planning
Mark E. Battersby, March, p. 50
Thatch
A.J. Turgeon, March, p. 58
Time management
Rudd McGary & Ed Wandtke, April, p. 70
Top 50 landscapers
Jeff Sobul, February, p. 22
Tree and shrub health problems
Terry A. Tattar, February, p. 70
Trees, measuring water stress of urban
Bruce R. Roberts, June, p. 64
Utility vehicles
October, p. 60
Valuing your company
Rudd McGary & Ed Wandtke, May, p. 56
Water, effluent
Jeff Sobul, November, p. 50
Water, turfgrass culture and
David Minner, February, p. 60
Water use, turf
Robert Shearman, March, p. 30
Weed control, post-emergence in cool-season turf
Bill Lewis, April, p. 34
Weed control, post-emergence in warm-season turf
Tim R. Murphy, April, p. 38
Weed control, pre-emergence in cool-season turf
Prasanta C. Bhowmik, February, p. 52
Weed control, pre-emergence in warm-season turf
Clyde Elmore, February, p. 56

CONTRIBUTING AUTHORS

Anderson, W. Powell, Ph.D.
A herbicide primer, January, p. 20
Baker, Stephen W.
Athletic field drainage, March, p. 68
Banko, Thomas J., Ph.D.
Growth regulators for trees and shrubs, October, p. 45
Battersby, Mark E.
Deadline tax planning, March, p. 50
Bedrossian, Bill
Soil fertility and fertilizers, August, p. 46
Bhowmik, Prasanta C., Ph.D.
Pre-emergence weed control in cool-season turf, February, p. 52
Christians, Nick, Ph.D.
Sulfur in turf management, March, p. 84
Cobb, Patricia, Ph.D.
Warm-season insect control, April, p. 60
Court, Edward R.
Small business and lawsuits, November, p. 60
Elmore, Clyde, Ph.D.
Pre-emergence weed control in warm-season turf, February, p. 56
Gallagher, John E.
Legislation and aquatic weed control, June, p. 32
Hall, John R. III, Ph.D.
Cool-season calendar for Athletic fields, January, p. 26
Haygood, Robert, Ph.D.
Diseases of warm-season turf, June, p. 21
Holtzman, Jay
Equipment tracking, November, p. 37
Jackson, Noel, Ph.D.
Diseases of cool-season turf, May, p. 48
Kovac, Carl
Preston Country Club, December, p. 38
Leatzow, James H.
It's a jungle out there, February, p. 76
Keys to avoiding recreation lawsuits, August, p. 54
Lewis, Bill, Ph.D.
Post-emergence weed control in cool-season turf, April, p. 34
Mazur, A.R., Ph.D.
Winter overseeding, October, p. 52
McGary, Rudd, Ph.D.
Management committees, Jan., p. 80; How fast is too fast?, February, p. 82; Corporate structure, March, p. 64; The time machine, April, p. 70; Valuing your company, May, p. 56; Dealing with part-time help, June, p. 72; Diversifying your business, July, p. 44; Down but not out, August, p. 42; The cost of layoffs, November, p. 58
Miller, Walker, Ph.D.
Diseases of warm-season turf, June, p. 21
Minner, David, Ph.D.
Turfgrass culture and water use, February, p. 60
Moehle, Ken
Compact tractors, October, p. 30, November, p. 34
Murphy, Tim R., Ph.D.
Post-emergence weed control in warm-season turf, April, p. 38
Niemczyk, Harry D., Ph.D.
Cool-season insect control, May, p. 25
Nuss, Jeff, Ph.D.
Turfgrass drought resistance, January, p. 32
Peterson, John
Engine irregularities, July, p. 30
Reilly, Ann
Perennial gardens, March, p. 42
Rieke, Paul E., Ph.D.
Soil management, April, p. 74
Roberts, Bruce R., Ph.D.
Measuring water stress of urban trees, June, p. 64
Roberts, Eliot, Ph.D.
Lawngrasses, May, p. 40
Poa annua problems, December, p. 30
Rosenquist, Roger
Spin-grinding reel blades, March, p. 34
Shearman, Robert, Ph.D.
Turfgrass water use, March, p. 30
Skogley, C.R., Ph.D.
Why fine fescues?, July, p. 24
Stefani, Marcia
Growth regulators for trees and shrubs, October, p. 45
Street, John R., Ph.D.
New concepts in turf fertilization, February, p. 38
Tattar, Terry A., Ph.D.
Tree and shrub health problems, February, p. 70
Turgeon, A.J., Ph.D.
Thatch, March, p. 58
Wandtke, Ed
Management committees, Jan., p. 80; How fast is too fast?, February, p. 82; Corporate structure, March, p. 64; The time machine, April, p. 70; Valuing your company, May, p. 56; Dealing with part-time help, June, p. 72; Diversifying your business, July, p. 44; Down but not out, August, p. 42; The cost of layoffs, November, p. 58

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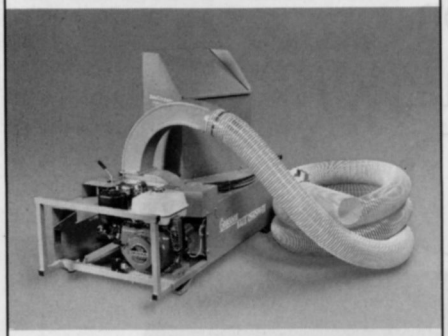

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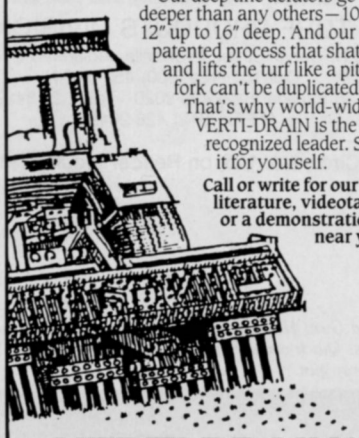

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The Pro-Star Commercial riding mower moves up to 10 mph and mows at speeds up to 6.5 mph. That means it

can mow more than two acres per hour.

Deck height adjustment of one to six inches in ⅝-inch settings is controlled with the foot while sitting in the seat, another time-saving factor.

The Pro-Star Commercial also revolves within its own sphere, making turns up to 360 degrees. Such maneuverability means quick and easy trimming, according to the manufacturer.

The machine comes with an 18 hp Kohler Magnum twin-cylinder engine.

Circle No. 191 on Reader Inquiry Card

Rotating sprinkler either pop-up or shrub

Hunter Industries has introduced the R-type rotating multiple stream sprinkler for turf and landscape. It is available as a four-inch pop-up or shrub model.

The sprinkler radius and arc of coverage are determined by interchangeable arc cones, which are available in 18 different arcs from 30° to 270°, in addition to a full circle.

The R-type sprinkler is factory-installed with a 90°, 180° or 360° arc cone. Odd arcs from 30° to 270° are available in 15° increments.

Precipitation rates range from .62 to .75 inches per hour. The radius can be varied from 21 to 28 feet.

Circle No. 192 on Reader Inquiry Card

Hand-held blower has many features

Maruyama's new commercial hand-held blower moves 400 cu. ft. per minute at 140 mph. The 21.2 cc engine, built to commercial specifications, features a chrome cylinder and heavy duty ball bearings.

The primer-type carburetor and

electronic ignition permit easy starting. The variable throttle also features high, medium and low settings so that

DEDOES CORE AERIFIERS

DEDOES aerators come in a variety of models, both pull type and the 3-point hitch to fit all applications. All **DEDOES** aerators have the patented hinged tines that enable you to pull a clean plug without tearing the turf. Drum type aerators are available with solid or screen sides and hinged doors so the cores can be collected. The disc type models feature heavy duty ¼" tines designed for the tough jobs.

MODEL JH DISC TYPE

INQUIRE FOR YOUR AERIFICATION NEEDS

DEDOES INDUSTRIES INCORPORATED

91 Roberts Road
Ossineke, Michigan 49766

(517) 471-5413
800-662-8235
Fax (517) 471-2548

Circle No. 110 on Reader Inquiry Card

First International Sports Turf Conference and Trade Show January 13-15, 1989

The Conference Center at Dogertown

STMA has selected Dodgertown for the 1989 Annual Meeting, Conference and Trade Show, located on the east coast of Florida in Vero Beach. The Dodgertown complex includes the Conference Center, guest rooms, dining facilities, a 27-hole championship golf course, 6 tennis courts, volley ball courts, and olympic-size swimming pool.

Show Dates and Hours
Saturday, January 14, 1989 8 A.M. - 1 P.M.
Sunday, January 15, 1989 8 A.M. - noon

For more information contact:

STMA - VND
400 N. Mountain Ave., Suite 301
Upland, CA 91786
(714) 981-9199

Sports Turf Manager's Association

Circle No. 162 on Reader Inquiry Card

IF YOU COULD PAY TWENTY BUCKS TO LIVE TWO YEARS LONGER, WOULD YOU?

©1988, Teledyne Total Power

Of course.

Yet that's pretty much the additional cost for an engine that outlives all others of its generation.

The Wisconsin Robin.

We've designed important components, like the automatic decompression system, with fewer moving parts. And greater size per part. Making the engine much better equipped to endure hardships, tribulations, and stresses without coming to an untimely end.

So in your search for equipment, make sure it has a Wisconsin Robin engine. And enjoy two extra years or so of productive, powerful life before you have to shell out several hundred dollars for a new engine.

For an extra twenty bucks, it'll seem like an eternity.

Wisconsin Robin

More power to you.

Circle No. 165 on Reader Inquiry Card

the operator can set it to run without continually working the throttle itself.

Optional vacuum attachments are available, making this a versatile blower/vac.

Circle No. 193 on Reader Inquiry Card

Centrifugal pumps made for lawn sprinklers

Berkeley Pumps has introduced a series of centrifugal pumps especially suited for lawn sprinkling applications. They are capable of operating from one to 30 or more sprinkler heads.

Called "some of the fastest priming pumps on the market," in the company's latest bulletin, the pumps are available in high head (LTH) or medium head (LTM) series.

The pumps feature leak-proof mechanical seals, easy-service design, heavy-duty motors and rugged construction.

Circle No. 194 on Reader Inquiry Card

Restore color to mulch with new spray product

Mulch Magic from Becker-Underwood restores mulch to its original bright color for three to five months.

The company says product and application cost works out to about $10 per 1,000 sq. ft. Application is by conventional backpack or hand-held sprayer.

The manufacturer says Mulch Magic is water soluble and does not harm plants.

Circle No. 195 on Reader Inquiry Card

AMT fleet addition loaded with features, options

The AMT 622 is the newest addition to the John Deere fleet of five-wheel

utility vehicles.

The 10 hp transport features a steering wheel, foot accelerator and brake pedal instead of handlebar controls. Dual headlights are standard. Options include tail and brake lights, turn indicators, horn, hour-meter, and electro-hydraulic dump for the 600-lb. cargo box.

Four-wheel drive with differential lock provides extra traction in wet ground, and high-flotation tires minimize ground compaction.

Circle No. 196 on Reader Inquiry Card

Exmark Parts Plus.℠

Parts overnight or free!

No one wants expensive downtime, so Exmark has done something about it. Our rugged and reliable mowers withstand the demands of commercial mowing. If you need replacement parts, our dealers stock full inventories. On the rare occasion they don't have the part you need, they can get it for you *overnight* — with Exmark Parts Plus. When your dealer places your part order by 1:00 p.m., your dealer will have it the next weekday, or it's free*! For more information or the dealer nearest you, call today:

402-223-4010.

*Some restrictions apply, ask your dealer.

The mark of excellence in professional turf care equipment.

When you need parts *plus* service, Exmark delivers.

eXmark® MFG. CO. INC.

EXMARK MFG. CO. INC. BOX 748 BEATRICE, NE 68310

Circle No. 118 on Reader Inquiry Card

For grounds maintenance, nurseries, Christmas tree farms, highway or municipal vegetation—for just about any grass control problem—Poast® herbicide is the simple solution.

Poast delivers consistent control of the toughest grasses. Like bermudagrass and crabgrass, quackgrass and foxtails. Yet, Poast is proven gentle to established plantings of valuable greenery. Like flowers, shrubs, trees and ground covers.

With Poast, you don't have to bother with directed or shielded sprays. You can apply Poast over-the-top of all stages of ornamental growth. And you don't have to worry about soil residue or leaching. Because Poast is meant to treat your grasses, not your soil.

And perhaps best of all, Poast can be highly cost efficient. It can eliminate labor-intensive and time-consuming hand roguing or hoeing. And labor and time equal money.

To keep grass in its place, always follow label directions and count on Poast—the last word in safe, effective grass control.

BASF Corporation
Chemicals Division

BASF

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Circle No. 120 on Reader Inquiry Card

CLASSIFIEDS

RATES: $1.20 per word (minimum charge, $35). Bold face words or words in all capital letters charged at $1.45 per word. Boxed or display ads: $100 per column inch-1x (one inch minimum); $95-3x; $90-6x; $85-9x; $80-12x. (Frequencies based on a calendar year). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $15 to total cost of ad. Send ad copy with payment to Dawn Nilsen, LANDSCAPE MANAGEMENT, 1 East First Street, Duluth, MN 55802 or call 218-723-9505. Fax Number 218-723-9615.

BOX NUMBER REPLIES: Mail box number replies to: LANDSCAPE MANAGEMENT, Classified Ad Department, 1 East First St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

Diversified lawn service company located in Iowa City. More than 600 accounts with 65% having continuous service for 5 or more years. Also power equipment, (Snapper, Cub-cadet, Echo and Green Machine), sales and service, lawn maintenance and indoor pest control. Call 319-354-7038. 1/89

For Sale: Western Colorado landscape contractor. In business since 1979. Revenue for last fiscal year around $1,000,000. Sales derived from pest control, lawn fertilization and maintenance, and reclamation seeding. Asking price $500,000, includes equipment value around $200,000. Further information write: Eric P. Wallace, CPA, 580 24 1/2 Road, Grand Junction, Colorado 81505. 1/89

FOR SALE, New Hampshire, nine hole executive golf course, 140 + acres, potential expansion and/or development. Includes home, club house, and equipment. $850,000. Lake & Mountain Realty, P.O. Box 663, Meredith, NH 03253. Tel: (603)279-4293. 1/89

EQUIPMENT MANUFACTURING BUSINESS Illness forces the sale of a patented speciality equipment manufacturing firm catering to the professional Lawn Care, Pest Control, Mosquito and Sanitary Maintenance industries. Sale includes all inventory, stock, patents, licenses and registrations for the United States, Canada and Australia. Write: LM Box 467. 1/89

HELP WANTED

ARBORIST - FIELD REPRESENTATIVE - B.S. degree preferred in Urban Forestry, Horticulture or related field. We offer Medical Plan, Profit Sharing, Savings Plan and Paid Vacation. Send resume with pay history to Ira Wickes - Arborists, 11 McNamara Road, Spring Valley, NY 10977. 914-354-3400, attention John. 1/89

WANTED TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15485 N. East Street, Lansing, Michigan 48906. Phone (517)484-7726. TF

HORTICULTURIST: Indianwood Golf And Country Club is now accepting applications for a HORTICULTURIST. Responsibilities include: Flowers on golf course grounds, clubhouse, a three acre estate, and greenhouse duties. Must have 2 years of education in Horticulture, and a minimum of 2 years experience. Salary is negotiable. Please send resume to: Mark Jackson, Indianwood Golf and Country Club, 1081 Indianwood Rd., P.O. Box 5, Lake Orion, MI 48035. 3/89

Arborist/Horticulturist - Established (20 years) tree care and landscaping company looking for an Arborist/Horticulturist. Year round supervisory position. Responsibilities to include tree care and landscaping sales, diagnosis of tree and plant material diseases and supervising crews. Competitive salary and excellent benefit package. Send resume and salary requirements to: JTO, INC., Tree Service Division, 9260 Progress Pkwy., Mentor, OH 44060. 1/89

Orkin Lawn Care, a Division of Rollins, Inc., Atlanta, Ga. is looking for good lawn care management & sales management candidates. We have a good management training program. Education and experience will count toward that training. Please call (404)888-2771, Sam Lang, or send your resume to Orkin Lawn Care Division, Personnel Director, P.O. Box 647, Atlanta, GA 30301. 1/89

NORTHWEST LANDSCAPE INDUSTRIES - NLI has the following positions open in the Portland, Oregon and/or Seattle, Washington Metropolitan area: Maintenance Area Supervisor; Construction/Irrigation Job Supervisor; Maintenance Area Manager; Construction Estimator/Administrator/Buyer. These are career positions with one of the Northwests largest and highest quality commercial landscape firms. Excellent salary and benefit package. Please send resume including salary requirements to: James E. Wathey, V.P., 16075 S.W. Upper Boones Ferry Road, Tigard, Oregon 97224. 2/89

ServiceMASTER.

If you are in the lawn care business, ...in a related field, or...just looking to get started...

WE CAN HELP YOU GROW!

Our network of over 3600 independently owned franchised businesses worldwide testifies to our ability to help the small business owner to flourish. If you are enthusiastic, growth-oriented, and interested in learning what ServiceMaster has to offer, then we are interested in getting to know you!

For more information call:

Roger Nondorf
ServiceMaster LawnCare
1-800-255-9780

LANDSCAPE MAINTENANCE SUPERVISORS Rapidly expanding landscape management firm seeking experienced, quality individuals to be field/working supervisors. Tremendous opportunity to grow. Full benefits. Contact: Tandem Landscape Company, 33W480 Fabyan Parkway, West Chicago, Illinois 60185, Attn: Glenn Kedzie. TF

Arborist/Horticulturist - Established (20 years) tree care and landscaping company looking for an Arborist/Horticulturist. Year round supervisory position. Responsibilities to include tree care and landscaping sales, diagnosis of tree and plant material diseases and supervising crews. Competitive salary and excellent benefit package. Send resume and salary requirements to:

KT ENTERPRISES INC., a commercial landscape management firm servicing the Washington D.C. Metropolitan market, is now accepting applications for employment in the landscape maintenance department for the 1989 season and beyond. All positions offer excellent salary, health benefits, retirement and most important, an incomparable opportunity to work in a quality organization that will continue to offer gross and professional satisfaction. Please send a resume to and/or call our Personnel Director Caroline Sennimore if you are interested in any of the following positions. Department Manager Plant & Turf applications. Supervisory-applications, Maintenance, Prunings, Floral. Sales, New Sales, Service Representatives, Landscape Senior Estimator - familiar with large commercial landscape projects. KT Enterprises Inc., "The Landscape Management Professionals," 7950-1 Woodruff Court, Springfield, VA 22151. (703)764-1870. 4/89

LANDSCAPE MAINTENANCE OPERATIONS MANAGERS: Rapidly growing Washington, DC based landscape contractor is expanding into the Philadelphia/Wilmington area. We are looking for an aggressive, highly motivated, quality conscious individual to oversee this new branch operation. Applicant should possess a thorough, well tested knowledge of all aspects of commercial landscape maintenance. Applicant will be responsible for complete control of all branch day to day operations to include: scheduling, personnel recruitment, quality control, marketing and equipment acquisition. This is a unique opportunity for the right individual, for a very worthwhile and profitable future with an established, quality conscious company. All qualified, interested individuals should send complete resume's, accompanied by references, and salary requirements to: Green Thumb Enterprises, Inc., 3825 Pickett Road, Fairfax, VA 22031. Attn: M. Gerard Chauvin. 1/89

We are recruiting!

We're looking for knowledgeable people in the following areas:

Environmental Care, Inc.
landscape management

Arbor Care
commercial & industrial arboriculture

Interiorscape Division
interior landscape maintenance

Positions available in:

Los Angeles	East Bay	Inland Empire
Sacramento	Santa Ana	Phoenix
San Diego	San Jose	Denver
Houston	Ventura	ColoradoSprings
Palm Springs		

Send resume to:
Robert L. Scofield
Personnel Department
24121 Ventura Boulevard
Calabasas, CA 91302

an equal opportunity employer by choice

Production/Sales/Management: Expanding Sod company seeks individuals with sod production experience and/or turfgrass sales background. Requires an individual that is willing to grow with the company and that is quality conscious. Company located on the East Coast with various sales and production locations. Good salary and benefits. Send Resume to: United Turf, Rt. 1 - Box 170, Powells Point, NC 27966. 1/89

MANAGEMENT

Due to our aggressive expansion program in the midwest, east coast and southwestern regions, we are needing management personnel for all phases of our tree & shrub and lawn care services, in both residential and commercial operations. If you are "Results-Oriented" with a strong desire to achieve and high personal goals, send resume including salary history to:

Corporate Recruiter
Ever-Green Lawns Corp.
1390 Charlestown Ind. Dr.
St. Charles, MO 63303

CLEVELAND OHIO EMPLOYMENT OPPORTUNITIES We offer excellent salary and benefit package and opportunities for advancement in our design/build firm. Our expansion plans include establishing a branch office. We are accepting applications for people with skills in landscape architecture, design-sales, supervision of landscape installation, maintenance, tree crews and nursery. Please send your resume or give us a call. Yardmaster, Inc., 1447 North Ridge Road, Painesville, Ohio 44077. (216)357-8400. 4/89

LANDSCAPE PROFESSIONALS!

Nationally-ranked landscape contracting firm **SCAPES, INC.** is seeking to hire highly-trained professionals into the position of **PROJECT MANAGER.** We have openings in our Atlanta and Washington, DC offices. Higher pay and bonuses for qualified person. Please contact **SCAPES, INC.** at (404) 956-7500 for interviews. Also hiring **EXPERIENCED LANDSCAPERS.**

SUPERVISOR OPPORTUNITIES. "INC. 500" company, the area's largest Design/Build and Maintenance/Irrigation firm is seeking quality individuals to supervise production operations. **LANDSCAPE SUPERVISOR:** planting and construction. **MOWING SUPERVISOR:** contract programs. **CHEMICAL/HORTICULTURE SUPERVISOR:** chemical applications, fertilization, pruning and plant care. Responsibilities include employee training, supervision, scheduling, customer relations, quality control and sales assistance. Experience, strong plant knowledge and communication skills are required. Great opportunity to work with a quality and results oriented team. Salary, benefits, profit sharing plan and company vehicle. Send resume: Suburban Landscape Assoc., P.O. Box 2342, Davenport, Iowa 52809, Attn: Monty Mitchell. 1/89

ARE YOU A NATURAL?

Then bring your talents to us. We're **SAV-A-TREE,** one of the fastest growing arboricultural service companies in the industry, specializing in natural holistic tree and shrub care.

We are dedicated to excellence and are seeking ambitious, detail oriented individuals to join our expanding team.

VP SALES

As a member of our management team responsibilities include major account management, sales forecasting and budgeting, marketing, recruitment, and training. Candidates should have an undergraduate degree or equivalent and an in-depth knowledge of arboriculture.

SALES REPRESENTATIVE

Responsible for developing and servicing a customer base in an assigned territory. Ideal candidate will have a college degree in horticulture or a related field and a strong desire to succeed. Previous sales experience is a plus.

These positions offer outstanding compensation.

Send resume with salary requirements to:

SAVATREE®
Stephanie Parker
360 Adams Street
Bedford Hills, NY 10507

Lawn Care $20M-$50M

Career opportunities coast-to-coast. Employer retained. Experts in personnel since 1968.

USA Careers 515-394-2556
New Hampton, IA 50659

ADVANCE YOUR CAREER Large and rapidly growing midwest landscape contracting and maintenance firm seeks quality, energetic, leaders. Must be able to schedule, train and motivate crews; skills would include: communication, blueprint reading, job layout, directing installation crews, pruning, 3 to 5 years experience. Looking For: Superintendents, foremen, foremen trainee's, and quality interested laborers. Wages and benefits commensurate with ability and experience. Send resume to: **TORRE & BRUGLIO LANDSCAPE CONTRACTORS,** 20401 Hall Road, Mt. Clemens, Michigan 48044. 2/89

LAWN CARE MANAGER: I am looking for a working manager for expansion of my company in the fast growing Washington, D.C. area. Granular seed and areation format. Full benefits. $25-$30K. Must be aggressive and willing to excel. (301)963-8996. Ask for Mike. 1/89

LANDSCAPE PROFESSIONAL to manage landscape operations. Experience in job estimating, plant installation, turf, spray operations, and landscape design desirable. Will consider new college graduate. Send resume with salary history to: Greener Lawns, Inc., P.O. Box 1442, Scottsboro, AL 35768. 1/89

Career Opportunity. Established Southwest Florida firm seeks qualified individual to take over pest control portion of business. Must be quality and result oriented. Salary limited only by your abilities. Send resume to Lawn Care Extraordinaire, 395 Havana Road N., Venice, FL 34292, or call 813-488-0688. 1/89

GROW WITH TURF: Career opportunities are available for professionals with experience in lawn care, landscaping and irrigation. We're looking for aggressive self-starters to join our organization. Thrive on the challenge of our growth. Enjoy above average earnings and excellent benefits. Send resume and salary requirements to Turf, P.O. Box 433, Moorestown, NJ 08057 or call 1-800-678-TURF. 1/89

MAINTENANCE DIVISION GENERAL MANAGER

Full Service Landscape Company with Design, Contracting, Maintenance and Nursery Divisions offers a career opportunity for a top notch manager.

Maintenance Division is currently grossing 2 million in annual sales with 50+ employees. Proven experience and results managing an organization of this size or larger a requirement.

Vibrant growing market area and strong company financial position make this a rare opportunity for growth if you are one of the Country's Best Landscape Maintenance Managers.

Send Resume and Salary History to:
1174 Florida Central Pkwy
Longwood, Florida 32750

READY FOR A CHANGE? COME JOIN OUR TEAM! Needed: "well seasoned" personnel *Residential Design/Sales *Production Manager *Field Supervisor *Mechanic/Yard Man *Foreman. Resume to: Dennis Anderson & Wife, Inc., 28433 N. Fremont Center Road, Mundelein, Illinois 60060. 2/89

Pennsylvania Landscape Design Build firm has opening for an experienced landscape designer/salesperson capable of assuming multiple duties relating to design build sales. Applicant must be a self-starter. Experience with **LANDCADD** helpful. Send resume and salary requirements: Gumpf Landscape & Design, 2103 Babcock Blvd., Pittsburgh, PA 15209. 1/89

ADVANCE YOUR CAREER & IMPROVE YOUR LIFESTYLE

Seeking Landscape Personnel and Foreman for positions in one of the largest leading Landscape Companies in the Hamptons. We are 45 years established, dynamic, professional, progressive and quality oriented.

OFFERING YOU: Subsidized housing, excellent competitive salary & benefits, rewarding teamwork atmosphere, and an exceptional way of life in the beautiful Hamptons.

OFFER US: Your experience and education, enthusiasm, responsibility, leadership and organizational abilities.

Send resume confidentially to:

WHITMORE-WORSLEY INC.
ATTN: JACK
P.O. BOX 10
AMAGANSETT, NY 11930
(516) 267-3756

LANDSCAPE EMPLOYMENT OPPORTUNITIES - One of the Midwest's largest commercial landscape contracting and maintenance firms seeks motivated, quality individuals to fill the following positions: Landscape Construction Superintendent, Estimator/Contract Administrator, Landscape Materials Buyer, Foremen, Pesticide Applicators. Excellent salary and benefit package. Send resume to: Reinhold Landscape, Inc., 23216 Telegraph, Flat Rock, MI 48134. 1/89

The Central Park Conservancy is a private non-profit organization dedicated to the restoration and preservation of New York's premier park, Central Park. We are seeking someone to fill the challenging position of Turf Care Coordinator for the Central Park Conservancy. Responsibilities will include management of high intensity use areas such as the Sheep Meadow, Bowling Greens, 26 Ballfields; over 500 acres of turf in all. A working knowledge of irrigation systems, installation and maintenance of lawns, familiarity with wide variety of power equipment. Daily management of field personnel, accurate record keeping required. Supervisory experience a must.

If you are a responsible, hard working quality oriented individual who meets these requirements, send resume with salary history to: Neil Calvanese, Director of Horticulture, Central Park Conservancy, 830 Fifth Avenue, New York, N.Y. 10021.

EOE

NEED LANDSCAPE WORKERS? We can solve any labor problem you have. We have documented workers as well as foremen, leadmen, irrigators and architects available at a price you can afford. Call today! **AMIGOS** Dallas, Texas **214-634-0500.** 1/89

GROUNDS MAINTENANCE/LANDSCAPE/LAWN CARE- Expanding grounds management and lawn care firm in Cincinnati seeks qualified and experienced personnel to fill openings in grounds maintenance, landscape construction, lawn care, and general pesticide application. Quality conscious individuals knowledgeable in ornamentals, turfgrass, landscape installation, grounds maintenance, irrigation, or pest management should respond. Outstanding compensation and benefits available. Letter or resume to **PROLAWN PROSCAPE,** 11488 Deerfield Road, Cincinnati, Ohio, 45242; Attn: Dave Osborn. (513)489-2433, days; 677-9108, evenings. 1/89

IPM Technician, Bedford Hills, NY. Excellent opportunity for knowledgeable, experienced professionals. Must be familiar with trees, shrubs, insects, and diseases of the northeast U.S. Ability to diagnose problems and treat with appropriate chemicals on-site required. Additional training will be provided. Join a fast-growing company with excellent pay and benefits. Send resume to: **Personnel Department, SAV-A-TREE, 360 Adams Street, Bedford Hills, NY 10507. 914-666-8202.** 2/89

IPM Technicians - We are leaders in the arboriculture industry and are looking for several IPM technicians to work in Westchester County, New York and Connecticut locations. Candidates must have a strong background in tree, insect and disease identification. Year round employment, liberal winter vacation policy, good salary and benefits including major medical, retirement plan. If interested in joining a rapidly growing, dynamic tree care company, please send your resume to John T. Moran, Alpine Tree Care, Inc., 275 Knollwood Road, White Plains, New York 10607. 1/89

LAWN EXPERT: Individual with education and experience to manage lawn service for progressive Central Jersey tree expert company. Growth opportunity. Send resume to P.O. Box 230, South Plainfield, NJ 07080. 1/89

Landscape maintenance Area Supervisors. Commercial & Residential Contractor seeks knowledgeable and hard working experienced field supervisors. Excellent Career opportunities for responsible, ambitious and self-motivated individuals with 4-yr. Horticultural Degree preferred. Excellent salary and benefits. We are one of the largest landscape contractors in the country and located in one of the fastest growing States, Florida. We welcome your resumes, Oyler Bros. Company, 1930 Silver Star Road, Orlando, FL 32804. 1/89

CAREER OPPORTUNITIES AVAILABLE. White Oak Landscape Co. Atlanta, Georgia is presently seeking qualified candidates to join our team in serving the landscape needs of one of the largest and fastest growing cities of the SE. We are a full service landscape contractor specializing in both commercial and residential bid build, design build, landscape maintenance, irrigation, and landscape illumination. In return for services, we offer a competitive salary and a strong benefit program. For consideration contact: Jim Lanier, 3220 Moon Station Road, Kennesaw, GA 30144. 404-427-0524. 1/89

FOR SALE

New Turf-type Perennial Ryegrass **"DANDY" "SPECTACULAR DARK GREEN TURF".** Bailey Seed, Inc., Salem, Or. 503-362-9700. 2/89

Bauer hard hose irrigator new in 1988. Water turbine drive, 1310' hose with hydraulic lift $27,500. (815)963-5015 (815)633-4998. 1/89

'78 Ford LN600 1100 gal. SS tnk w/mech ag. 2 reels, 20/20 pump, 16 HP engine. $15,000 or **BEST OFFER** 317-966-7397. 2/89

Brouwer Sod Harvesters. Two reconditioned and ready to go. 18" roll W/ 48" Pallet Well. One with Ford 3910, one with Ford 3600. **Case** 586C Field Fork Lifts - Reconditioned-Like new. 2, qty. **Brouwer** Hitch Hiker Fork Lifts - New, used and demos - W/ Kubota Diesel Engines. **Spyder** Fork Lift - Diesel, 500 hours, Extenda-Forks, Perfect Condition. **Hyster** Shop Fork Lift 4000# capacity-Side Shift, Pneumatic Tires, Excellent condition. **Brouwer** Standard P.T.O. Mowers, 4 qty. and 7-Gang Demos. **Peerless** Reel & Bedknife Sharpener Model 1300. **Brillion** 10' Turf Seeders, new and used. Huber Ranch Power & Turf, Schneider, IN 46376. 219-552-0552. 1/89

HYDRO-MULCHERS AND STRAW BLOWERS New and used. **JAMES LINCOLN CORPORATION,** 3220 S. Jupiter Rd., Garland, TX 75041. (214)840-2440 (TX), (800)527-2304 (except TX). TF

ATTN: GOLF COURSE SUPERINTENDENTS--Bentgrass Sod at putting green height, guaranteed weed and poa annua free. Stormy Acres, West Haven, VT 05743. 802-265-3046. TF

FOR SALE: Established Garden Center and Landscaping business in Upper Michigan. (Both or just Garden Center). Owners retiring. For more information write: P.O. Box #7872, Ann Arbor, MI 48107. 1/89

Finn Hydroseeders, Mulch Spreaders, Krimpers, Pit Burners, Fiber Mulch & Tackifiers. New & Used. Wolbert & Master, Inc., P.O. Box 292, White Marsh, MD 21162, 301-335-9300. TF

Spyder Forklifts-Diesel $10,000.00, Gas $9,500.00, Good Condition. Meyers Turf Farms, Stilwell, Kansas 66085. (913)681-2668. 1/89

TURF TIPS For Lawn Care: Video Tapes by the Cooperative Extension Service at Michigan State University and the Michigan Turfgrass Foundation. Excellent for training and educational programs. Can be used by lawn care companies, golf course superintendents and all grounds supervisors. LAWN ESTABLISHMENT, GENERAL LAWN CARE, LAWN GRASSES, FERTILIZATION, WEED CONTROL, LAWN MAINTENANCE and, soon, CALIBRATION. VHS or Beta. $60.00 each or 7 for $375.00. For information call (517)355-0270 or write Michigan Turfgrass Foundation, Box 80071, Lansing, Michigan 48908. 4/89

SPYDERS--New/Used/Rebuilt. New Kohler engines, short blocks and a complete line of engines and Spyder replacement parts. New Style Nichols-Fairfield Torque Hub Kits, Heavy duty Wilton Caster, Hub Kits, Remote Air Cleaner Kits, heavy duty Carriage Side Plates, Call or Write: Mobile Lift Parts, Inc., 5402 Edgewood Rd., Crystal Lake, IL 60012. 815-455-7363. 2/89

NORTHWEST TRAILERS -- CUSTOM LANDSCAPING TRAILERS. Protect your investment from exposure and theft. Northwest Trailers, Palatine, IL 800-522-6208 or 312-577-6208. 1/89

LAWN SEED: Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 89 Hanna Parkway, Akron, OH 44319. Call collect (216)724-1266. TF

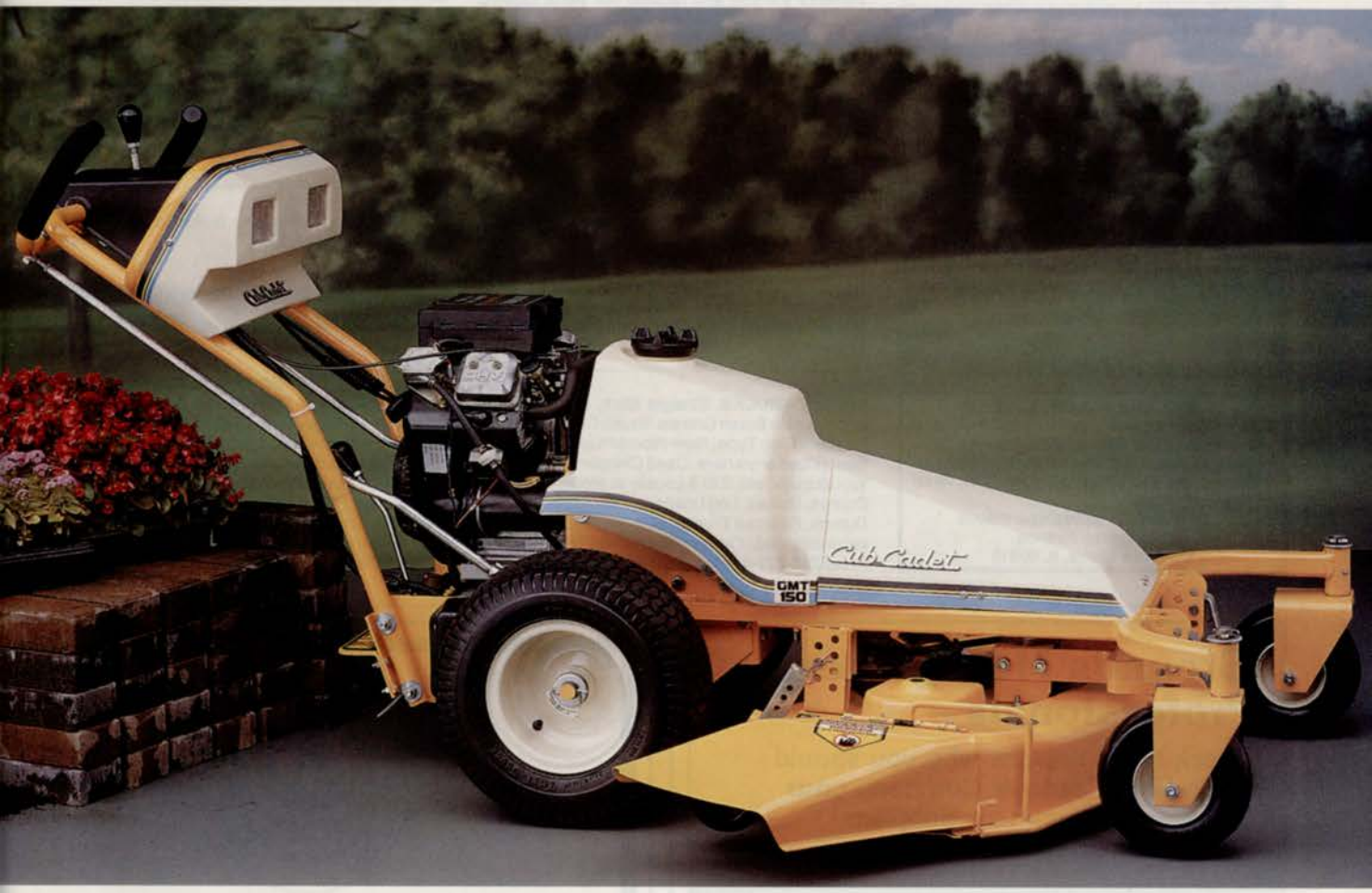
REINCO HYDROGRASSERS and power mulchers in stock. Opdyke Inc. (Philadelphia Area) 215-721-4444. TF

ATTENTION GOLF COURSE SUPERINTENDENTS: Great Meyer Zoysia for your Fairways and Tees. Guaranteed Bermuda free. Beauty Lawn Zoysia (Cincinnati) 1-513-424-2052. TF

PIPE LOCATOR - Inexpensive! Locates, traces underground drain lines of clay, PVC, ABS, steel culvert, orangeburg, cement. Finds PVC, steel water lines, buried metal, plastic sprinklers, valve boxes, clogs in lines. Bloch Company, Box 18058, Cleveland, Ohio 44118. (216)371-0979. TF

Tree Spades - Burkeen Demos: AM70 on 88 International, AM70 on 80 Mack, AM50 on 86 Nissan, Low mileage. Used Vermeer TS66 on six-wheel drive Ford. Call 800-647-9824. 1/89

INTRODUCING ONE TOUGH, VERSATILE MACHINE



Today It's A Mower, Tomorrow A Snowthrower.

It's the commercial machine that converts easily to handle your year-round maintenance needs.

Which means a mower easily becomes a power brush, a snowthrower, or any of a number of machines, with attachments available from Cub Cadet. *You'll* need only one machine—our rugged Power Unit can handle it all.

Built For Durability, Versatility, and Muscle.

- Your choice of three powerful electric start Vanguard engines: 8.5 HP single cylinder OHV, and 12.5 or 15 HP twin cylinder OHV
- Beltless final wheel drive for sure-footed power, even on wet turf
- Planetary transmission, with five speed ranges in forward *and* reverse
- No-clutch, no-stop, forward-to-reverse shifting for easy movement around trees and shrubs
- Standard electric PTO switch, ammeter and hourmeter
- A separate steering clutch on *each wheel* for effortless turning
- Automotive-style U-joint to power attachments for quick conversion to other functions
- Your choice of three cutting decks: 32″, 38″ or 46″
- An optional 6-bushel bagger
- An optional steerable sulky

The Tough Machine That's Right For You—Right Now!

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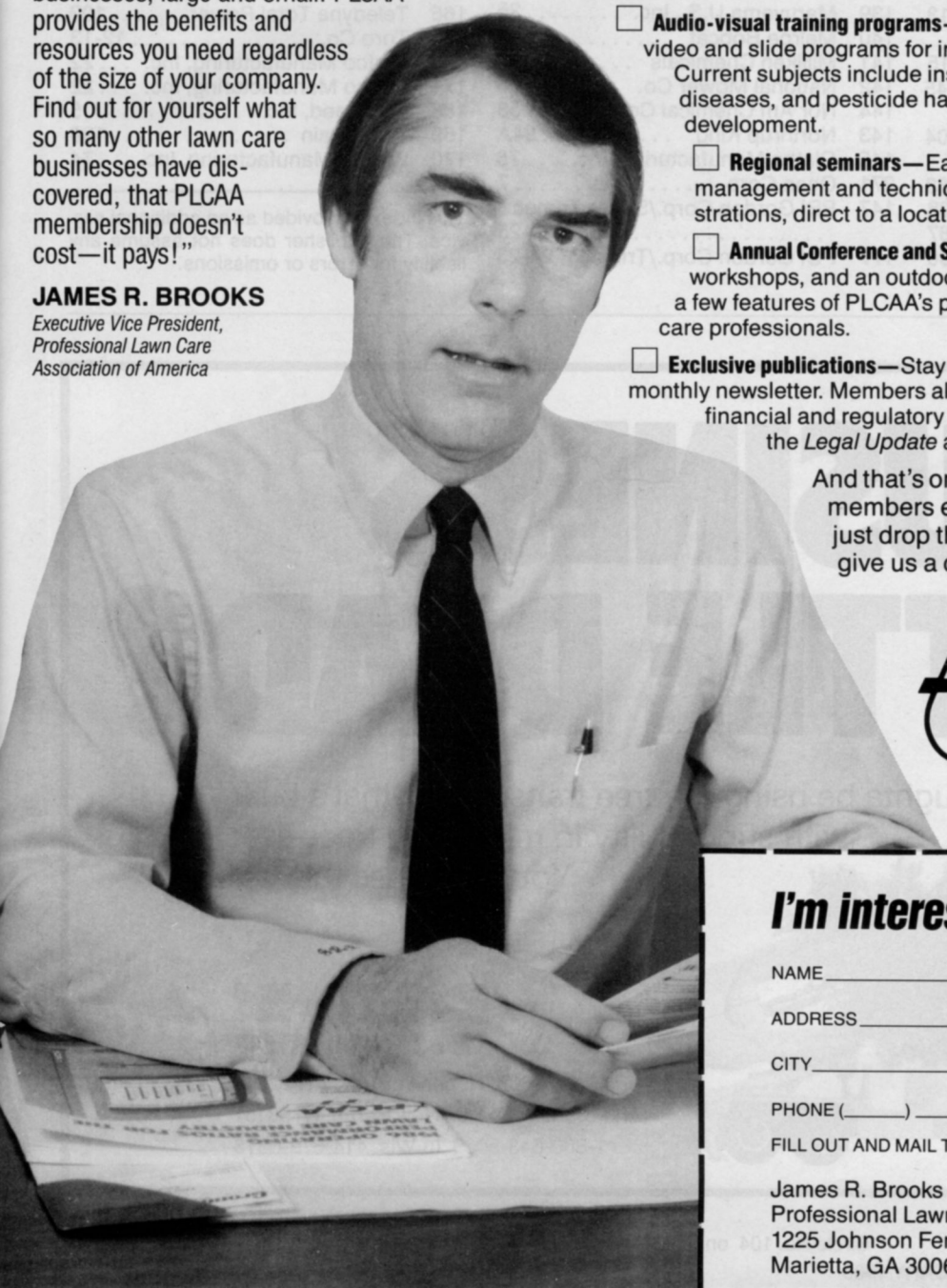

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ADVERTISER INDEX

NO.	ADVERTISER	PAGE
101	Agrotec.	62
102	Aquatrols Corp. of America, Inc.	97
120	BASF Corp.	105
103	Barebo, Inc.	22A
173	Ben Meadows Co.	112
104	Big John Tree Transplanters	114
105	Bluebird International, Inc.	88
106	Brouwer Turf Equipment	85
107	Bunton Co.	33
108	Cub Cadet Power Equipment	111
109	Cushman Motors	17
172	Ryan/Lawnaire IV	37
110	DeDoes Industries Inc.	102
111	Deere and Co., John	28-29
112	Dow Chemical Co.	34-35
113	Elanco Products Co./Surflan	79
114	Elanco Products Co./XL (Regional)	113
115	Elanco Products Co./ XL Ornamental	15
117	Excel Industries, Inc.	45
118	Exmark Manufacturing Co., Inc.	104
119	Fermenta Plant Protection Co.	83
121	Fuerst Brothers, Inc.	98
122	Garfield Williamson, Inc.	87
123	Goossen Industries	100
280	Gravely International, Inc.	95
125	Hahn Turf Products	99
126	Hoechst Roussel Agri-Vet Co.	75
127	Howard Price Turf Equipment	59
128	Hydro Turf And Associates	22B
129	ICI Americas	43
130	International Seeds, Inc.	73
131	Jacobsen Div. of Textron, Inc.	89
132	KLM Bio-Systems, Inc.	22B
133	Kubota Tractor Corp.	49
134	Lebanon Chemical Corp./Butler	39
135	Lebanon Chemical Corp./ Ronstar	20
134	Lebanon Chemical Corp./ Betasan	93
137	Lesco, Inc.	CV3
138	Lofts Seed, Inc.	CV4
139	Maruyama U.S., Inc.	26
140	Melroe Bobcat	81
141	Milliken Chemicals	27
142	National Mower Co.	16
144	Nor Am Chemical Co.	53
143	Northrup King	94A
145	Olathe Manufacturing, Inc.	76
271	Onan Corp.	7
147	PBI Gordon Corp./Super Trimec	24-25
177	PBI Gordon Corp./Trimec	24-25
148	PBI Gordon Corp./Ferromec	60-61
116	Par-Ex	1
149	Pickseed West, Inc.	57
150	Precision Laboratories, Inc.	72
151	Promark Products, Inc.	41
152	RGB Laboratories, Inc.	101
241	Ransomes, Inc.	51
153	Reemay , Inc.	77
154	Rhone Poulenc Ag Co.	63-70
155	Rhone Poulenc Ag Co.	31
157	Safer, Inc.	18-19
161	Salco, Inc.	21
158	Sandoz Crop Protection	54-55
159	Sandoz Crop Protection	2-3
160	Seed Research Co.	23
162	Sports Turf Managers Assoc.	102
164	Tecumsah Products Co.	80
163	Tee 2 Green Corp.	CV2
165	Teledyne Total Power	103
166	Toro Co.	12-13
167	Turfco Manufacturing, Inc.	22
171	Turfco Manufacturing, Inc.	22
168	Turf Seed, Inc.	5
169	Verti-Drain	100
170	Walker Manufacturing, Inc.	74

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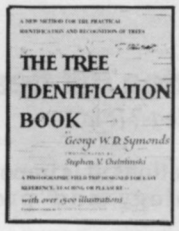

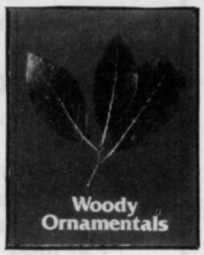

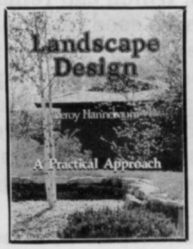

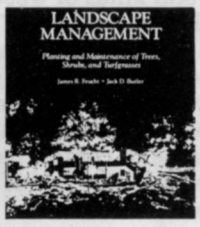

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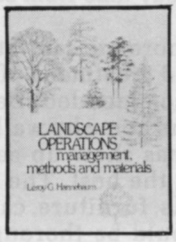

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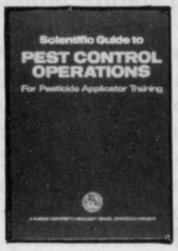

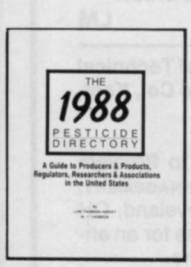

500 - THE 1988 PESTICIDE DIRECTORY
by Lori Thomson Harvey and W.T. Thomson
A Guide to Producers and Products, Regulators, Researchers and Associations in the United States. For the person who needs to know anything in the United States pesticide industry. Includes Basic Manufacturers and Formulators with their products, key personnel, managers, district/regional offices and other pertinent information. For United States pesticide information in one place, this directory is a must.
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LM

by **Balakrishna Rao,** Ph.D.

Sanitation, insecticides kill fleas

Problem: *How do you destroy fleas? (Fla.)*

Solution: To manage flea populations, it is important to learn about their biology and proper identification.

Cat fleas are frequently found in houses and in yards where dust and organic debris accumulate. They can attack dogs, cats, foxes, raccoons and even humans. They may not bite hard, but their irritation is painful.

Fleas are capable of transmitting infectious diseases. Adult fleas are ⅛-inch long, wingless insects with piercing/sucking mouthparts. They are dark reddish-brown with a flat body. They can jump several feet when off the host. Cat fleas undergo complete metamorphosis (egg, larvae, pupae and adult). The females lay four to eight tiny, white oval eggs after each blood meal.

Eggs hatch in about 10 days and the larvae feed on dried blood, bits of feces and other materials. They go through three molts which may take from seven days to several months.

To manage flea problems, thorough sanitation, proper use of insecticides and treatment of the pet(s) by a veterinarian is recommended. Determine the hot spots of fleas in the home by walking wearing white socks. Dark fleas show up easily when they jump from floor to the host. The suspected area, such as floor cracks, furniture, carpet edges and pet sleep area, should be thoroughly vacuumed prior to treatment to remove larvae, pupae and organic debris.

Also, pet hairs should be cleaned and pet bedding should be discarded or washed in hot soapy water.

For indoor treatment, application of insecticides such as malathion premium grade 3%, diazinon (Knox Out 2FM) 1% or propoxur (Baygon) 1% is recommended. Reports also suggest that dust of bendiocarb (Ficam D) 1% and Pyrethrins (Drione) 1% can be effective too. In addition, there are some automatic foggers containing ronnel (Korlan) plus dichlorvos (Vapona) available in canister, which will knock down and kill many adult fleas.

Outdoor areas frequented by pets should be treated with insecticide such as Ficam, Sevin, Dursban, diazinon, malathion, propoxur or silica gel. In addition, pets should be treated by a veterinarian for flea problems.

Check with your local extension personnel for further advice.

Eliminating perennial weeds

Problem: *The landscaping division of our company undertakes new lawn establishment in new home developments. Often in these newly-seeded lawns, we find a lot of annual and perennial-type weeds. Although we follow good lawn establishment procedures, a lot of these unsightly perennial grassy weeds appear gradually over time. Our clients think that these weeds are from our seed mixtures.*

Can we use Roundup or a fumigation method to kill the weeds prior to establishment? (Pennsylvania)

Solution: Several different factors such as the cultural practices used prior to seeding, the type of seeds used, mulching, post-seeding care, seed germination and seedling establishment can partially contribute to weed establishment in any newly-seeded lawn.

Generally, most soils contain thousands of seeds of several kinds of weeds, which can remain viable in soil for many years. These seeds as well as vegetative parts of certain weeds can present problems whenever soil is disturbed, particularly perennial grassy weeds. Therefore, prior to tilling, grading and seed bed preparation, the first step in soil preparation should be to control persistent weeds. This can be achieved by the use of non-selective herbicides or soil fumigation.

Use of non-selective herbicides such as glyphosate (Roundup) should make the existing vegetation easier to manage. Remember, this product will not have any effect on viable weed seeds in the soil, which may present a potential problem later. Therefore, wait for three to four weeks and repeat applications if desired.

If your objective is to get rid of all viable plant structures, fumigate the seed beds. Before fumigating, prepare the soil for seeding by covering the seed beds with polyethylene (plastic) covers while applying 250 to 300 lbs. of methyl bromide per acre. Keep the plastic cover on beds for 48 hours after fumigation and make sure its edges are firmly secured. Then, before seeding, remove the plastic and let the seed beds air out for 48 hours. Remember that methyl bromide is highly toxic; therefore, follow good safety procedures while fumigating. Read and follow the label specifications.

Besides this method, weed populations can also be minimized to some extent by:

1. using weed-free certified seed with good germination potential;

2. maintaining seed and soil contact when seeding;

3. using good mulch cover to maintain moisture and temperature, protect seeds from erosion and discourage bird feeding;

4. keeping the seeded area moist throughout the germination and establishment period; and

5. if only a few weeds are present, consider using either pre- or post-emergence herbicides to manage these weeds, only after the turfgrass has established. Remove persistent weeds by sanitation (digging where practical) or spot treat with a non-selective herbicide like Roundup. Then reseed these areas.

LM

Balakrishna Rao is Manager of Technical Resources for the Davey Tree Co., Kent, Ohio.

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